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GEOGRAPHIC INTELLIGENCE REPORT

THE CHUKOTSK PENINSULA

CIA/RR-G-10

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THE CHUKOTSK PENINSULA

I. Introduction

The Chukotsk Peninsula forms the easternmost extremity of the Soviet Union. Only the narrow Bering Strait separates the Chukotsk Peninsula from Alaska on the east. On the north it is bounded by the Chukotsk Sea and on the south by the Anadyrskiy Zaliv (gulf) of the Bering Sea. Zaliv Kresta and the northward flowing Amguyema River form the western limits of the peninsula. Within the political-administrative framework of the Soviet Union, the peninsula comprises a part of the Chukotskiy Natsional'nyy Okrug, which is subordinate to the recently formed Magadanskaya Oblast'. (See Map 13508.)

The population of the peninsula is sparse, consisting mainly of Russians, Chukchi, and Yuits (Asiatic Eskimos). For most of the native population the sea is the principal source of livelihood. The settlements of the Chukotsk Peninsula -- consisting of Russian military installations, Soviet outposts, and native villages -- are small and are located along the coast. The largest Russian settlement is the port of Provideniya, which functions chiefly as the eastern fueling and provision base on the Northern Sea Route. Although Russian settlements are dependent almost entirely upon supplies and equipment shipped in by sea during the ice-free season, remote outposts and installations are accessible by air the year round. Since the outbreak of World War II, Soviet strategic interests in the Chukotsk Peninsula and the Northern Sea Route have resulted in the expansion of military installations, especially air facilities.

Terrain, climate, vegetation, and animal life vary greatly within the Chukotsk Peninsula. It is a land of low mountains separated by broad, glacial valleys. The tundra-covered valleys and coastal lowlands are dotted with lakes and marshes. Numerous shallow rivers empty into the sea via the many bays and lagoons that indent the long coastline. The valleys and lowlands support a variety of vegetation adapted to their short, cool summers and long, cold winters. Despite the arctic environment, animal life is fairly abundant, both on the land and in the adjacent seas.

The major significance of the Chukotsk Peninsula lies in its strategic location, approximately 50 miles from the North American Continent, and any increased activity in the region, especially along the coast, would be prompted almost exclusively by military considerations. Further socio-economic development is highly unlikely since the indigenous population is scant, isolated, and relatively primitive,

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and the natural conditions are not conducive to colonization for agricultural or industrial purposes.

Despite the strategic location of the peninsula, military operations are currently limited by the lack of sites for airfields, the inadequacy of harbor facilities, and the paucity of overland routes. Sites suitable for airfields are limited primarily by the mountainous character of the terrain. Air activity is further limited by the difficulty of constructing and maintaining airfields under permafrost conditions and by the restricted visibility caused by fogs, haze, and snowstorms. Harbors are inadequate because of the shallow offshore waters and the short ice-free season. The only developed harbor serving the peninsula is Provideniya. Although some increase in port facilities is possible, the size and nearshore depths of Bukhta Emma (Emma Bay) preclude any large-scale expansion of the harbor. Overland routes on the peninsula are few and primitive. The tundra-covered landscape, with its numerous mountains, marshy lake-dotted valleys, and coastal lowlands, presents major obstacles to overland transportation.

III. Population

The population of the Chukotsk Peninsula consists mainly of Russians, Chukchi, and Yuits, most of whom are concentrated along the coast in and around Soviet and military settlements and outposts. The most densely populated stretch of coastline is along the Bering Strait from the vicinity of Mys (cape) Dezhneva southward to Bukhta Provideniya. Along this extent of the coast are the principal Russian centers of Uelen, Lavrentiya, and Provideniya. Except for a sparse population, mostly nomadic reindeer herders scattered along a number of the river valleys, the interior is largely uninhabited.

A. Russians

Russians dominate the political, economic, and military activities of the Chukotsk Peninsula. Polar stations, schools, trading posts (Figure 1), trapping stations, and medical and veterinary stations along the coast serve as bases for political and economic integration. Schools are the centers of political indoctrination, and many young Chukchi are members of the Komsomol. The Kul'tbaza or cultural station, which is now known as Lavrentiya, was organized to aid in the sovietization of the peninsula. Reindeer, fishing, and hunting collectives have also been set up to extract greater material contributions from the natives. Soviet border-patrol personnel, members of the MVD (Ministry of Internal Affairs), are also reportedly stationed at intervals along the coast. 1/ They enforce certain travel

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Figure 1. Soviet trading post in the Yuit village of Chaplino. The whale bones in the foreground are used as drying racks.

restrictions upon the natives and have completely prohibited the exchange of visits and trade between the Siberian and Alaskan Eskimos. Some Chukchi are reported to be in the special service of the MVD.

Since the outbreak of World War II, increasing Soviet strategic interests in the Chukotsk Peninsula have resulted in the construction and expansion of military installations, particularly air facilities. The continuing expansion of military facilities has significantly increased the population. An army camp with an estimated total of over 5,000 men is located in the vicinity of Provideniya. Provideniya, the largest Russian center on the peninsula, is an active port town that had an estimated population of 1,000 in 1943. Other important Russian settlements include the administrative centers of Uelen and Egvekinot and the military bases of Uel'kal' and Chaplino. Egvekinot has been designated the administrative center of the newly-formed Iul'tinskiy Rayon, but no further information about it is available.

Slave and forced laborers drawn from a number of different ethnic groups have been reported in the Chukotsk Peninsula. Laborers are shipped to Provideniya for assignment to penal camps on the peninsula. 2, 3/ The Provideniya penal camp is believed to be located northeast of the settlement. Laborers are engaged in the extraction of minerals and in the construction of military installations.

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B. Chukchi

The Chukchi are the largest group of natives on the Chukotsk Peninsula. They call themselves Luorovetlany and are of Paleoasiatic origin. The Chukchi consist of two native groups -- the sedentary Maritime Chukchi, who live chiefly along the coast, and the nomadic Reindeer Chukchi, who are scattered throughout the interior. In general, the economy of the Chukchi is at the subsistence level. The Maritime Chukchi hunt sea mammals, trap, and trade; the Reindeer Chukchi hunt, fish, and tend herds of semidomesticated reindeer. The Soviets have attempted to stabilize the population by organizing reindeer, fishing, and hunting collectives. Many natives also engage in ivory carving. At Russian village stores the native groups sell or trade ivory carvings, furs, seal oil, and reindeer hides for sugar, brick tea, tobacco, and other items. Among other highly prized articles are needles, chewing gum, chewing tobacco, and cloth. Some natives also derive a small income from part-time or seasonal employment in various Soviet installations.

The Chukchi people are medium tall and slender with round heads, flat faces, thick lips, noses set low between puffy cheeks, and black eyes and hair (Figure 2). The Chukchi language is a Siberian Amerindian (Paleoasiatic) dialect. There are no sharp differences between the Reindeer and Maritime Chukchi dialects. A large number of the younger Chukchi have been educated in Soviet-established schools (Figure 3) and speak Russian. As a result of indoctrination received in these schools the younger people are reported to be pro-Soviet, whereas older people are inclined to be anti-Soviet and more sympathetic to Americans. The older inhabitants remember the pre-World War II trade with Alaskan Eskimos, who made periodic trips to their shores with American goods.

The Chukchi diet consists mainly of meat supplemented by fish, bird eggs, plant foods in season, and items purchased at Soviet trading posts. The natives wear clothing made primarily of reindeer and seal skin. Red is a favorite color, especially among the women. The Russians have banned all types of religious activity, but many natives still believe in shamanism. The Chukchi are very superstitious.

The cohesiveness of the Maritime Chukchi is based on the use of communal hunting and fishing grounds. The head of the family that has lived longest in the community is master of the village. A family includes the husband, one or more wives, and the children. Prestige increases with age, but in the past the old and infirm were killed.



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Figure 2. Young Maritime Chukchi in the settlement of Uelen.
Native skin-covered yarangas in background.



Figure 3. Native students in a Russian school at Uelen.

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Among the Reindeer Chukchi the family is still a relatively closely knit unit. Families are banded together to form the camp which is the economic unit. The Reindeer Chukchi are very conscious of wealth, which is measured by the number of reindeer and the quantity of personal property.

C. Yuits (Asiatic Eskimos)

The Yuits form the second largest native group on the peninsula. Like the Maritime Chukchi, they live in coastal settlements consisting of clusters of yarangas (native dome-shaped huts), and depend largely upon the sea for a livelihood. The Yuits are concentrated chiefly along the coast of the Bering Strait and on the western shores of Zaliv Kresta. 4/ In some cases their villages have been absorbed by the Chukchi. During the navigation season, a number of Yuits are employed at Provideniya. 5/ In 1943, a group of about 500 Eskimos, mostly nomadic reindeer herders, were reported at Uel'kal' on the western shores of Zaliv Kresta. 6/ Many of these natives may have been engaged part time in the construction of the Uel'kal' airfield.

The Yuits are usually short and stockily built; they have narrow rudimentary noses, large jaws, somewhat pointed heads, swarthy complexions, and black hair and eyes. The clothing, diet, and religion (shamanism) of the Yuits are similar to those of the Maritime Chukchi. The Yuits speak a language closely related to that of the American Eskimo. Many also speak Chukchi and Russian; a few understand some English. There are indications that as late as 1944 Yuits exchanged visits and traded with American Eskimos in Alaska, but all such contacts have been severed by the Soviets. In 1948 the Soviet Government took further action and arbitrarily terminated a 10-year-old agreement with the United States that permitted Eskimos of Little Diomed Island, which is under US control, to visit friends and relatives in neighboring Ostrov Ratmanova (Big Diomed Island). These acts have created considerable resentment among the Yuits.

Yuit social structure has no apparent class distinctions. There is little evidence of communal ownership of property, but individuals may own certain objects jointly. Every able-bodied member makes his contribution to household and community work. Community disapproval of an individual results in banishment or death.

III. Settlements and Soviet Installations

Settlements on the Chukotsk Peninsula are located chiefly on the many bays and small indentations along the coast. Less numerous are

the interior settlements, which consist chiefly of camp sites of nomadic Reindeer Chukchi scattered along the river valleys.

The principal settlements of Provideniya, Uelen, Lavrentiya, and Uel'kal' are Soviet military and economic bases. Provideniya, the largest, is an important port on the Northern Sea Route and the site of probably the major Soviet military base on the Chukotsk Peninsula. Uel'kal' is primarily a Soviet Air Force Base. Other Soviet installations include polar stations, radio stations, trading posts, and airfields.

Most of the settlements are small, and most have two distinct sections -- a part occupied by Russian personnel and an adjoining native village. Living and working quarters of the Soviet personnel consist of prefabricated wooden barrack-type houses symmetrically arranged. Some of the Soviet quarters are electrified. The native Maritime Chukchi or Yuits live in yarangas or dome-shaped huts made of layers of reindeer, seal, or walrus skins stretched over frameworks of wooden poles or whale bones and fastened to low sod or stone walls that surround the structures. They are dimly illuminated by smoky, smelly seal-oil lamps. The yarangas in the native section vary in number from 10 to 65 and are scattered about haphazardly. An occasional wooden building may serve as a native dwelling or a communal building, or it may house a Soviet installation of some type. Public utilities are at a minimum. Potable water for the villages is usually obtained from wells and streams in summer and by melting snow in winter.

Since World War II the Soviets have expanded and improved their military facilities and installations on the Chukotsk Peninsula. According to fragmentary reports, Soviet guided-missile bases may be located at Vankarem and Kurgak, and possibly on the coast of the Dezhnev Massif. There are four active airfields of the Soviet Air Force -- Uel'kal', Provideniya/Urelik, Chaplino, and Lavrentiya -- on the peninsula. Jet and reciprocating-engine fighter planes are the principal types of military aircraft in use, but Soviet light bombers have been known to land at Uel'kal'. In addition to these airfields, 12 other landing areas or airstrips have been reported on the peninsula. 7/ Although most of these are poorly developed, they do provide sites for future expansion.

Polar stations established and operated by the Glavsevmorput' (Main Administration of the Northern Sea Route) are located at frequent intervals along the coast of the Chukotsk Peninsula. Most are parts of the military complexes at established coastal settlements, but a few small stations are located at points remote from other permanent settlements.

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The stations serve as links in a chain of scientific observation posts that extends along the entire coast of the Soviet Arctic. Stations range from 2- or 3-man posts that operate only during the navigational season to larger units that operate throughout the entire year.

The work of the average station consists of collecting hydrological, hydrographical, and meteorological data, and of forecasting weather and ice conditions, but the larger stations may undertake special research and local exploration. Information is disseminated to advance stations along the sea lanes and air routes, as well as to passing aircraft and ships. Incidental duties include the study of the local area and the native population, and the integration of the area into the economy of the Soviet Union. Stations are also responsible for rescue work and aid to seamen, trading agents, and the local population.

A typical station consists of several wooden structures -- including meteorological and radio shacks, radio masts, a wind-driven generator, a hydrographic station, living quarters, and a storehouse for supplies, provisions, and fuel, as well as shelter for dogs. Generally the radio station is isolated from other structures as a fire-prevention measure. The stations are operated by Russian personnel, but local natives may be hired for minor duties. When the services of a polar station are no longer required, it is usually deactivated. According to reports, a deactivated station is stocked with motor fuel, coal, and food and can be put back into operation in a few days. 8/

A. Provideniya

Provideniya is the largest center on the Chukotsk Peninsula and, like the other larger settlements, is a center for Soviet activities of various types. During the ice-free season, Provideniya is the focus of shipping activities for the entire Chukotsk region. It also serves as a staging area for westbound convoys along the Northern Sea Route. The port facilities are situated on the northwestern shore of Bukhta Emma (Figure 4), a short eastern arm of Bukhta Provideniya.

The population of Provideniya numbered about 1,000 in 1943. Most of the people are Russians who are employed directly or indirectly by Glavsevmorput' or by the Communist Party.

The town covers a mile of shoreline and includes over 150 buildings of various sizes. Most are wooden structures, but newer buildings may be made of stone or brick. Dominating the center of the town is a large administration building several stories high, which is believed

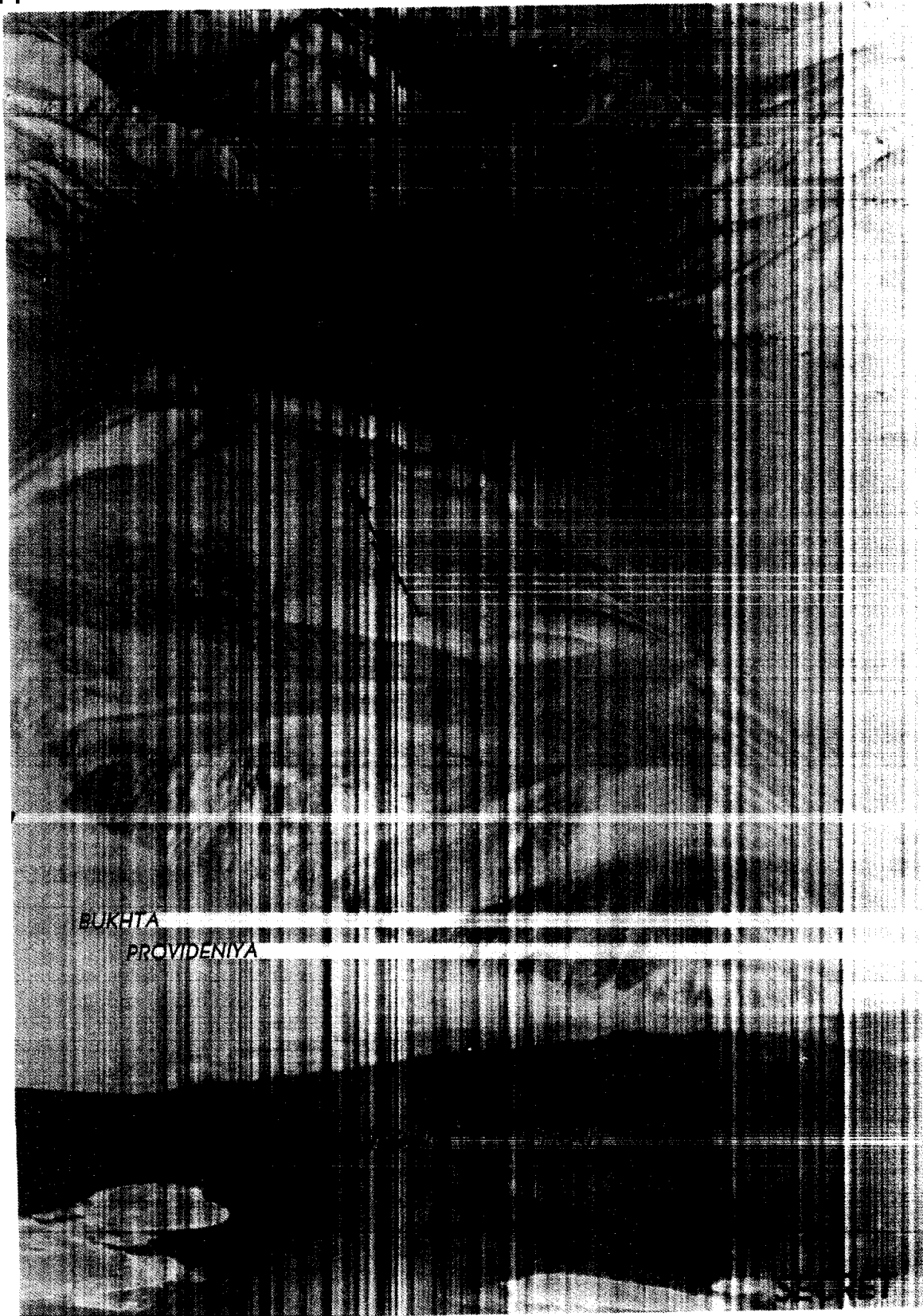


Figure 4. Winter view of the port town of Provideniya on the western shores of Bukhta Emma. On the opposite shores of the bay is the site of a major military installation.

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to be the center of Glavsevmorput' operations for the Chukotsk Peninsula. A polar station, a coaling station, and one of the three Glavsevmorput' hydrographic bases are located in the vicinity. Additional installations include a sawmill, a brickyard, a printing plant, a bakery, and an electric powerplant operating on coal. Among the public buildings of Provideniya are a bank, post office, courthouse, jail, small hospital, and school. A telephone system is reportedly installed for official use only. 3, 9/ A Soviet border patrol headquarters, which maintains constant communication with coastal outposts, is also reported. 3/ At the northern end of the town is a seaplane station.

Harbor facilities of Provideniya include several wharves, a number of mobile cranes, and probably limited facilities for ship repair. Oil storage tanks with a capacity estimated at 450,000 gallons are located about 400 meters (1,300 feet) north of the harbor. Ships of the Soviet Navy are reported to operate out of Provideniya during the navigation season. 2/

Functioning as a part of the Provideniya complex is the largest military installation on the peninsula, located at the site of the native settlement of Urelik on the southern shore of Bukhta Emma. It is the largest of the Soviet military installations close to Alaska. The camp is probably the military-command and supply headquarters for the entire Chukotsk Peninsula. It contains over 500 buildings, including a number of radio stations, several motor pools, repair facilities, and a large warehouse area. The garrison is estimated to number a minimum of 5,400 men (roughly the equivalent of one Soviet regimental combat team), plus supporting coastal artillery and antiaircraft units. The camp has its own port and an airfield that is also used by civil aircraft. It is possible that a penal camp for political prisoners or an ammunition dump may be located in the valley northeast of Bukhta Emma. Undoubtedly the entire military installation is well guarded, and security controls are strictly enforced.

About 4 miles southeast of the camp is a large storage area that includes approximately 30 warehouses, 135 smaller buildings, and 2 motor pools. A major airfield used by both military and civil aircraft is located immediately south of Urelik, and a short distance southwest of Urelik is a seaplane station with about 15 buildings.

Two smaller settlements, Plover and Avan', probably also function as part of the Provideniya complex. Plover, on the eastern shore of Bukhta Provideniya southwest of Urelik, is the site of a border patrol substation, two radio stations, a power-generating windmill, and a fishing village. The border patrol personnel undoubtedly maintains surveillance over all ship traffic in Bukhta Provideniya. Avan' is located on the Bering Sea coast at the southern end of Ozero Avan'.

Until 1952 the frozen surface of this lake in the vicinity of Avan' was used as a winter landing area. With improvements in the Urel'ik airfield the ice strip has probably been abandoned.

Communication facilities throughout the Provideniya area are well developed. Six radio stations, four reported at the military installation and two located at Plover, probably maintain constant communication with Provideniya. 3/ Radar stations, and antiaircraft and coast artillery positions are located throughout the Provideniya area as well as near other military installations along the coast.

B. Uelen

Uelen, the administrative center of Chukotskiy Rayon, is located near the easternmost tip of the Chukotsk Peninsula. The settlement occupies a narrow sand and gravel spit that extends from the base of Dezhnev Massif northeastward along the Chukotsk Sea (Figure 5). Uelen, with an estimated population of approximately 500 in the mid-1940's, is one of the largest settlements of the Chukotsk Peninsula. About 65 frame buildings and native yarangas comprise the settlement.

At Uelen is one of the largest polar stations of the Northern Sea Route, and a radio station is located on the spit west of the settlement. A dirt road reportedly leads from Uelen southward to the coastal village of Dezhnev.

Uelen is a stop on the Anadyr-Moscow airline. In summer the firm surface of the spit northwest of Uelen is used as an airfield. A seaplane station is located on Laguna (lagoon) Uelen. In winter, ski- and wheel-equipped aircraft also use the lagoon as a landing strip. Both the polar and radio stations support operations on the adjacent seaplane station and airfield. Located within the settlement are a school, a trading post, a medical center, and a power-generating windmill which supplies electricity to Uelen. An observation post, located atop the cliff immediately east of the settlement may be operated by the Soviet border patrol reportedly stationed in the vicinity of Uelen. 10/ Personnel of the border patrol station probably check the movements of all boats in and out of Uelen. Two coal mines and a radar station are located in the vicinity of Uelen.

C. Lavrentiya

Lavrentiya is a coastal settlement located at the base of a small sandy cape on the southern shore of Zaliv Lavrentiya (Figure 6). It consists of a small native village and a Russian settlement that includes a cultural center, a military airfield, and a polar station.

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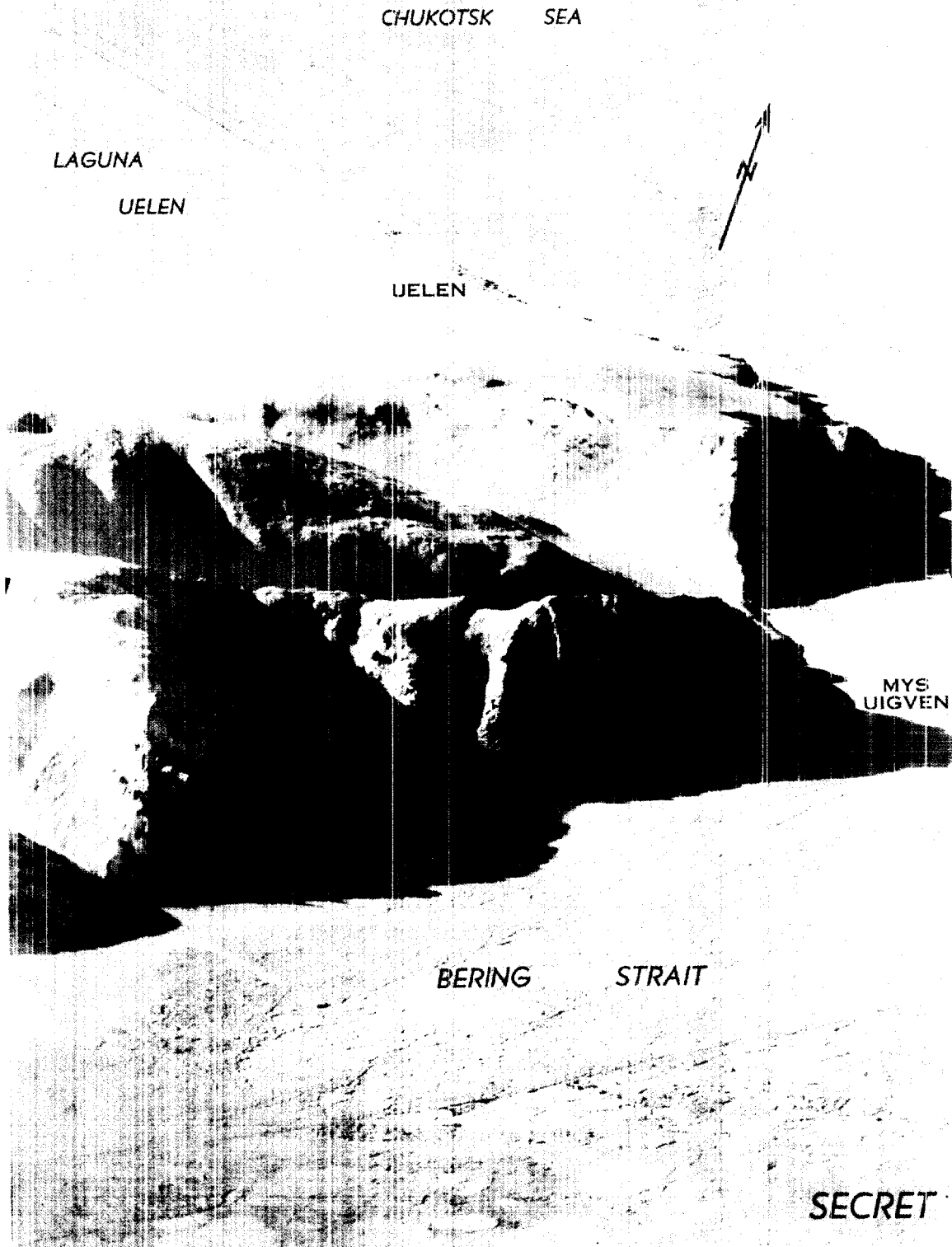


Figure 5. Uelen at the northern edge of the Dezhnev Massif.



Figure 6. Lavrentiya settlement and airfield on Mys Kytrytkyn.

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The Chukchi village, with its characteristic yarangas, is separated from the Russian settlement by a small stream. In 1937 the native village was called Natepelmer. At this time the Russian settlement was referred to as Kul'tbaza and served as a Soviet political, cultural, and educational center. The present-day Russian settlement includes a hospital, a zootechnical and veterinarian station, a courthouse, a school with dormitories, living quarters for workers, a radio station, and a small powerplant. Local and regional administrative offices are also said to be located here. 11/

The airfield is located east of the settlement and may be used for year-round operations. Although primarily a military airfield, reconnaissance planes of the Northern Sea Route and MVD probably use the landing strip.

The polar station installations are located about 2 kilometers (1 mile) northwest of Lavrentiya on a cliff overlooking Zaliv Lavrentiya. The personnel operating the 15 units comprising the polar station collect and disseminate hydrographical and meteorological data.

According to a 1945 source the Russian population outnumbered the Chukchi two to one and included approximately 400 whites who operated the facilities at the cultural base, polar station, and airfield. 11/ According to recent aerial reconnaissance reports, however, the facilities of the Lavrentiya area are not adequate to house a population of this size. 12/

D. Uel'kal'

Uel'kal' is a small village on the barren western shore of Zaliv Kresta. During World War II, Uel'kal' became the site of a Soviet airfield and the principal port of entry for United States lend-lease aircraft and materials ferried from Alaska. Since that time, the airfield has continued to expand and has become a major Soviet airbase of the Chukotsk Peninsula. The airbase is located about 2 kilometers (1 mile) south of Uel'kal' and runs in a northeast-southwest direction parallel to the coast.

In 1943, probably at the peak of World War II operations, the population of the Uel'kal' area was reported to be about 500 civilians, mostly Yuits, and 2,000 military personnel. 6/ According to current intelligence reports, however, the facilities of Uel'kal' are not adequate to house a population of this size. 12/

approximately 60 buildings at the airbase, 35 in the village and 12 at the cantonment west of Uel'kal'. About a mile northwest of Uel'kal' is a radio station with 12 buildings.

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This may be the site of a Northern Sea Route polar station that was established during World War II. A radar site is probably located in the vicinity of the airfield.

Uel'kal' has no port facilities. Supplies must be lightered from vessels anchored offshore.

E. Chaplino

25X1D0a The village of Chaplino is approximately 45 kilometers (28 miles) east of Provideniya, on the sand and gravel spit that forms Mys Chaplina. [REDACTED] the settlement of Chaplino consists of approximately 85 structures of various sizes, including housing and storage facilities for the Soviet personnel at the adjacent airbase, the border patrol station, and the polar station, as well as the scattered huts of the native population. 11/

The airfield, which is used by both military and civil aircraft, is located west of the settlement. Although the field is reported to be in operation only during the summer, seaplanes may use the salt-water lake immediately to the northwest. 11/ The border patrol station situated on the southern shore of the spit is the headquarters for security forces of the area. A 24-hour watch of the surrounding waters is maintained from the patrol's two observation towers. The station is equipped with a radio, a small power generator, and a wind-driven generator.

East of the border patrol station is the Northern Sea Route polar station, which consists of about seven wooden buildings that house personnel and equipment. Facilities available include a radio station that transmits ice and weather information collected by reconnaissance planes, a fog signal, and a power generator.

F. Naukan

Naukan is a Chukchi coastal village on the rocky southeastern slopes of the Dezhnev Massif (Figure 7). On the seaward side of the village, low coastal cliffs drop fairly abruptly to a narrow sand and gravel beach. A mountain stream from the steep hills west of Naukan flows through the center of the village and empties into the Bering Strait. During the summer the stream and local wells provide water for the village.

Between 1940 and 1943, the population of the village was 300 persons living in about 60 dwellings. 13/ Most of the structures are native yarangas, but a number of wooden buildings are scattered throughout the village. Soviet installations in Naukan include a radio

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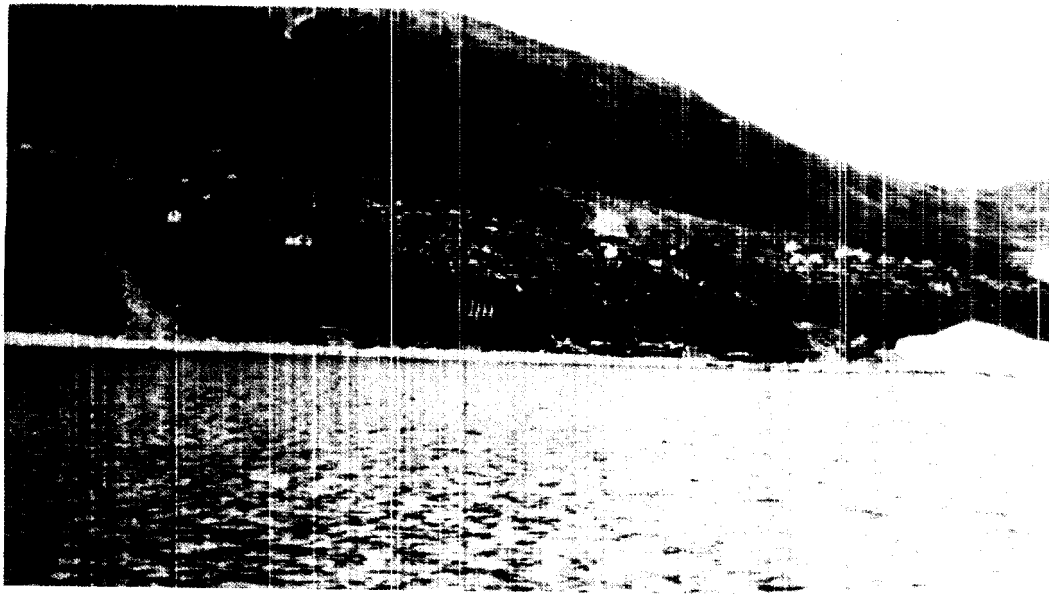


Figure 7. The native trading settlement of Naukan on the Bering Strait south of Mys Dezhneva.

station, a school, a lighthouse, and a number of low barrack-type buildings, which probably provide living and working space for Russian personnel. According to a recent Soviet newspaper article, a new polar station has been opened at Naukan. 14/ Some military personnel are stationed at Naukan for local police and security duties such as checking incoming boats and personnel.

G. Dezhnev

Approximately 8 miles west of Naukan is the small coastal trading settlement of Dezhnev, the site of a former polar station. [REDACTED]

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[REDACTED] The frame buildings probably include a former school (with a radio station on the second floor), a trading post, and housing for the Soviet residents of Dezhnev.

H. Enurmino (Mys Serdtse-Kamen' Polar Station)

The small native village of Enurmino and the Mys Serdtse-Kamen' Polar Station are situated approximately 125 kilometers (78 miles) northwest of Uelen. The village and polar station lie several miles west of Mys Serdtse-Kamen' along the shore of a small bay that is protected by two capes.

The village of Enurmino consists of 20 to 25 native yarangas. At the northeastern end of the bay is another native settlement -- Netekenishkhvin -- with approximately 65 native huts.

The Mys Serdtse-Kamen' Polar Station is one of the smaller stations along the Northern Sea Route. The polar station and a number of scattered native yarangas are situated on the bluff on the eastern cape. Approximately 150 meters (500 feet) south of the polar station is a communication center that includes a radio station, a wind-driven generator, and a number of antennas.

I. Vankarem

The village of Vankarem is located on the northern coast of the Chukotsk Peninsula, at the mouth of the Vankarem River. The village and the associated polar station are situated on Mys Vankarem, the rocky promontory at the end of a long, low spit that parallels the coastline (Figure 8). To the east of Mys Vankarem is the narrow inlet to Laguna Vankarem.

Approximately 34 native dwellings make up the small village of Vankarem. The economy of the village is based upon hunting, trapping,

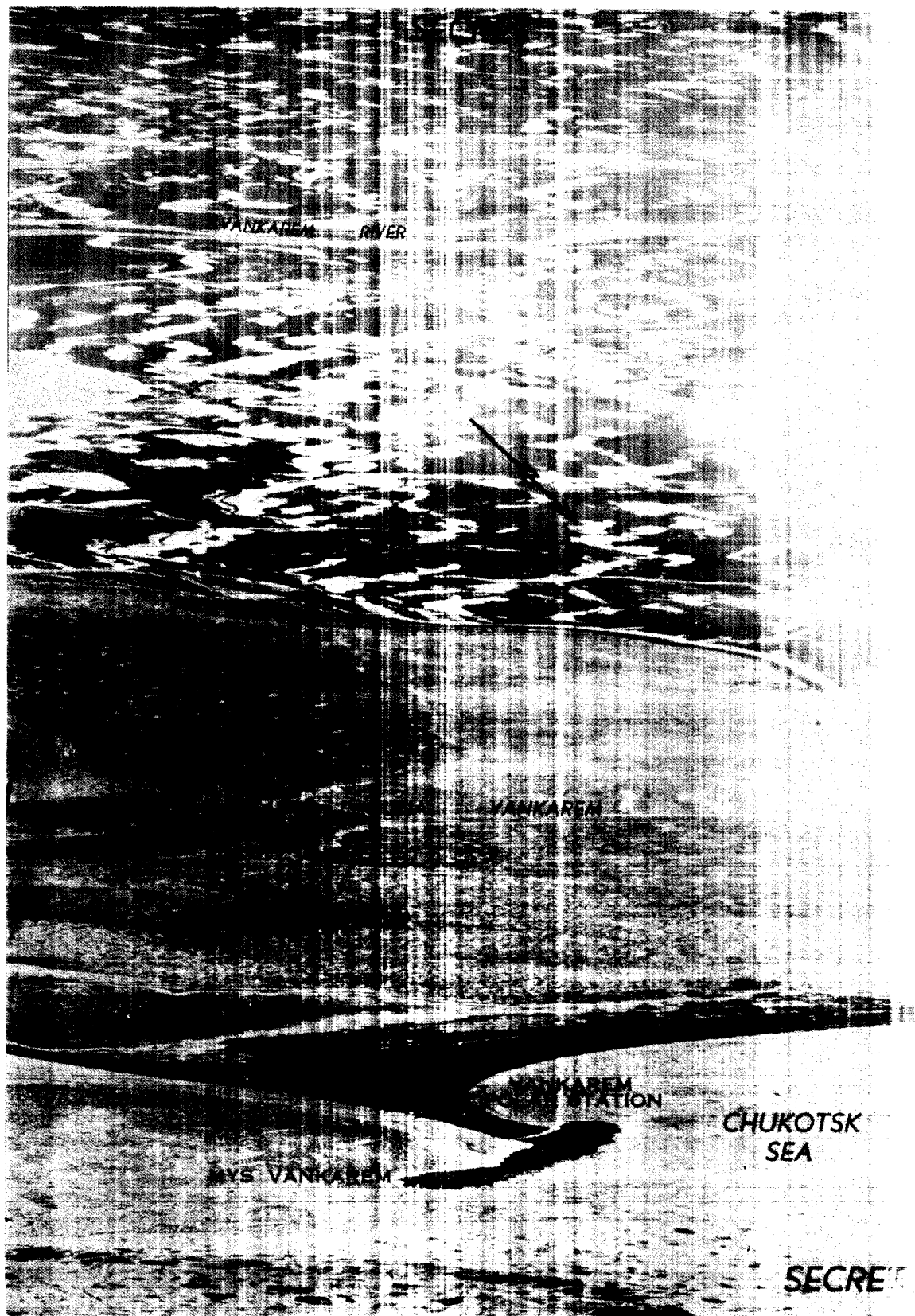


Figure 8. The rocky promontory of Mys Vankarem on the northern shore of the Chukotsk Peninsula.

and fishing. Natives exchange their goods for Soviet manufactured articles. As early as 1935, a Soviet border patrol unit was reported to be stationed at Vankarem. 15/

The polar station, which includes approximately 21 buildings, lies west of the native village and is the center of activity at Vankarem. About 10 of the buildings make up the radio station, which is situated south of the polar station headquarters. The radio station, which includes a wind-driven generator and a number of tall antenna masts, provides ice and weather information to planes and ships in the Chukotsk Sea. Southwest of the radio station is an airstrip.

J. Other Polar Stations

There is only limited information on the remaining four active polar stations along the coast -- Ostrov (island) Kolyuchin, Mys Dzhennetlen, Ostrov Ratmanova, and Zaliv Kresta. The Ostrov Kolyuchin Polar Station is reported to be one of the smallest Northern Sea Route stations. 16/ It is situated on the northwestern end of a small off-shore island and includes four small log buildings, a wind-driven generator, and a number of antenna masts. A navigation aid may be located in the vicinity of the station. The exact location of the polar station called Mys Dzhennetlen is unknown. Conflicting reports place the station southwest and southeast of Mys Dzhennetlen. An additional report discussing this station locates it on the eastern shore of Guba (bay) Kolyuchinskaya. 8/ The Ostrov Ratmanova station is located on an island in the Bering Strait, about 40 kilometers (25 miles) southeast of Mys Dezhneva. A recent report indicates that it was in operation in 1953. 17/ During World War II, this station performed extensive studies of currents and was a center for general hydrological work in the Bering Strait. The Zaliv Kresta station, located on Mys Kamenny at the northern end of the bay, was reported to be active as late as 1953. 17/

In addition to the Uelen Polar Station, an earlier polar station was established in 1916 at Dezhnev along the southern coast of the Dezhnev Massif. In 1933, most of the polar station installation was moved to Uelen, and Dezhnev continued to function merely as an annex to the Uelen Polar Station. The Dezhnev station was closed in 1935 for the lack of personnel and does not appear on later 1948 lists of active stations.

In 1937 the Pereval'naya Polar Station was established at a point in the Anguyema Valley now identified on Soviet maps as Amguyem. This is the only polar station on the Chukotsk Peninsula that is not situated on the coast. It was established near a mountain pass

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primarily to operate a radio beacon and provide weather data for aircraft flying the Anadyr'-Mys Shmidt route. It was reported to have an air strip. 18/ Since there has been no postwar information concerning this station, its present status is unknown.

From 1945 to 1947 a polar station operated in the vicinity of Kosa (spit) Dvukh Pilotov at the mouth of the Amguyema River. 19/ This station appears to be identical with an Ust'ye Amguyemy station mentioned in a 1940 Russian periodical. No information is available on the facilities or present operational status of this station.

IV. Transportation

Transportation on the Chukotsk Peninsula is based almost entirely upon air and sea routes. Air transportation provides year-round service to the remote Soviet installations and villages. The vast majority of supplies and equipment, however, arrive by boat during the short ice-free season and are stockpiled for the long winter. Overland transportation is, for the most part, limited to dog teams and sleds during the winter season.

A. Air Transportation

Nonmilitary air flights over the Chukotsk Peninsula are generally seasonal, unscheduled, and of a local nature. Only a few regular runs connect the peninsula with other parts of the Soviet Union. The first regular air flights were established in 1935. They followed the coast from Anadyr' to Mys Shmidt, with stops at Bukhta Provideniya, Uelen, and Vankarem. In January 1937, a shorter alternate route was developed via Zaliv Kresta and the newly established Pereval'naya Polar Station (at Amguyem). In 1939, a long-distance seaplane route was reported to operate on an irregular schedule from Nikolayevsk-na-Amure to Uelen. In July 1947, regular bimonthly passenger and postal air service was inaugurated between Provideniya and Moscow. Planes leave Provideniya on the 5th and 20th of each month and Moscow on the 1st and 15th of each month. Regular patrol flights over shipping lanes are made by ice and weather reconnaissance planes of the Glavsevmorput'. Glavsevmorput' aircraft also participate in the Arctic expeditions and rescue operations and deliver mail, supplies, and equipment to remote polar and radio stations along the Northern Sea Route. Military planes and reconnaissance aircraft of the MVD are also active in the area.

Since World War II, several airfields and numerous airstrips have been developed along the coast of the Chukotsk Peninsula. The larger airfields at Uel'kal', Provideniya, Chaplino, and Lavrentiya have been expanded and now serve as the bases for Soviet Air Force and Glavsevmorput' air operations on the peninsula.

Uel'kal' is believed to be the largest and most completely equipped Soviet Air Force base on the Chukotsk Peninsula. During World War II the airfield was a stop for lend-lease aircraft and materials ferried from United States bases in Alaska. The airfield, located approximately 2 kilometers (1 mile) south of Uel'kal' village, has a hard-surfaced runway that extends in a northeast-southwest direction parallel to the coast. 20/ It measures approximately 1,370 meters (4,500 feet) in length and 75 meters (250 feet) in width. There are about 60 buildings on the field, including a control tower, radio station, powerplant, motor pool, hangars, barracks, and coal and petroleum storage facilities. The field is equipped with a beacon and flarepot runway lights.

Provideniya/Urelik is a civilian and military airfield located on the eastern shore of Bukhta Emma, immediately southwest of Urelik. The airfield, which is the terminus of both long-distance and local air routes, has probably increased in importance with expansion of the adjacent military installation. Recent reports indicate that the runway has been improved for year-round operations. 3/ The runway extends in a north-south direction and measures approximately 1,520 meters (5,000 feet) by 60 meters (200 feet). During the winter the airstrip is surfaced with packed snow. At the northern end of the airstrip, there are about 25 buildings, which are probably associated with airfield operations.

Chaplino airfield, located on the tip of Mys Chaplina, is reported to be operated only during the summer. The airstrip has a gravel and clay surface. It is approximately 1,220 meters (4,000 feet) long and 60 meters (200 feet) wide and is oriented in an east-west direction. Near the airfield is a cluster of six buildings and a communication center is located in the nearby settlement of Chaplino.

Lavrentiya airfield is primarily a Soviet Air Force base. The field lies in the northwestern part of a small sandy spit near the entrance of Zaliv Lavrentiya. The airstrip is oriented in a north-south direction and is estimated to be between 900 and 1,220 meters (3,000 and 4,000 feet) in length and between 55 and 67 meters (180 and 200 feet) in width. 11/ It is reported to be macadam surfaced and may be capable of year-round operations. The only two buildings at the airfield are a radio station and barracks, but other facilities may be located in the nearby settlement, about 1 kilometer (1/2 mile) to the northwest.

Along the coast, there are a number of seaplane stations with permanent installations. The most important are located at Provideniya and Urelik on Bukhta Emma and at Uelen on Laguna Uelen. Generally these seaplane stations include port facilities, a radio station, and

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several additional buildings. Other seaplane stations are also reportedly located in the vicinity of Uel'kal', Epryan, Mys Pinakul' on Zaliv Lavrentiya, and Vankarem and at an unknown location on Guba Kolyuchinskaya. 7/

B. Water Transportation

Historically, the seaways have been the primary arteries of transport for the few scattered settlements on the Chukotsk Peninsula. Although supplemented recently by the development of air service and better forms of land transport, the sea remains the major medium of movement. Summer is the period of great shipping activity since the settlements must obtain practically their entire annual store of supplies and equipment during the short ice-free season. The length of the navigation season, which varies from 2 to 4 months, increases from north to south. The navigation period commonly lasts from July through September, but it may be extended somewhat with the aid of the icebreakers stationed at Provideniya. Although the sea is the major form of transport, port facilities are relatively undeveloped.

Provideniya, with 4,500 meters (1,370 feet) of berthing space, is the only deep-water port on the Chukotsk Peninsula. In addition to 4 wharves with depths alongside of 10 to 12 meters (35 to 40 feet), Bukhta Emma has free-swinging anchorage for at least 15 vessels. In 1941, the port was equipped with 22 mobile cranes and several conveyors. Provideniya is the focus of shipping activities for the entire Chukotskiy Region. A large petroleum storage area is located approximately 400 meters (1,300 feet) north of the harbor. Since 1933, Provideniya has been an important coaling station on the Northern Sea Route. The coal is shipped in from the Ugol'nyy mines on the southwestern shore of Anadyrskiy Zaliv and is stockpiled in Provideniya for transshipment, as needed, to the other settlements along the coast. In addition to fuel for heat and power, the major imports are lumber, military equipment, and foodstuffs.

Naval activities of Bukhta Provideniya are of a limited scope. Submarines and light surface craft are reported to operate out of Bukhta Provideniya during the summer. 2/

Deep-water anchorage is possible in the bays of Kresta, Provideniya, and Lavrentiya, but even in July and early August the entrance of the latter two may be blocked by drifting ice. Because of the shallow water along most of the coast, ships are unable to approach the other settlements and must transfer their cargo to lighters and small boats.

For pelagic hunting and for traveling between villages, the native population uses skin-covered boats (umiaks) and wooden whaling

boats, which may be equipped with motors (Figure 9). The Amguyema, Vankarem, Ioniveyem, and Khel'khymleveyem Rivers are navigable for whaling boats and serve as trade routes between the Maritime and Reindeer Chukchi. The Amguyema, the largest river, is navigable for about 240 kilometers (150 miles), the Ioniveyem for approximately 20 kilometers (12 miles) upstream from Guba Kolyuchinskaya, and the Khel'khymleveyem for approximately 15 kilometers (9 miles) upstream. Movement on the latter is hazardous because of numerous shoals.

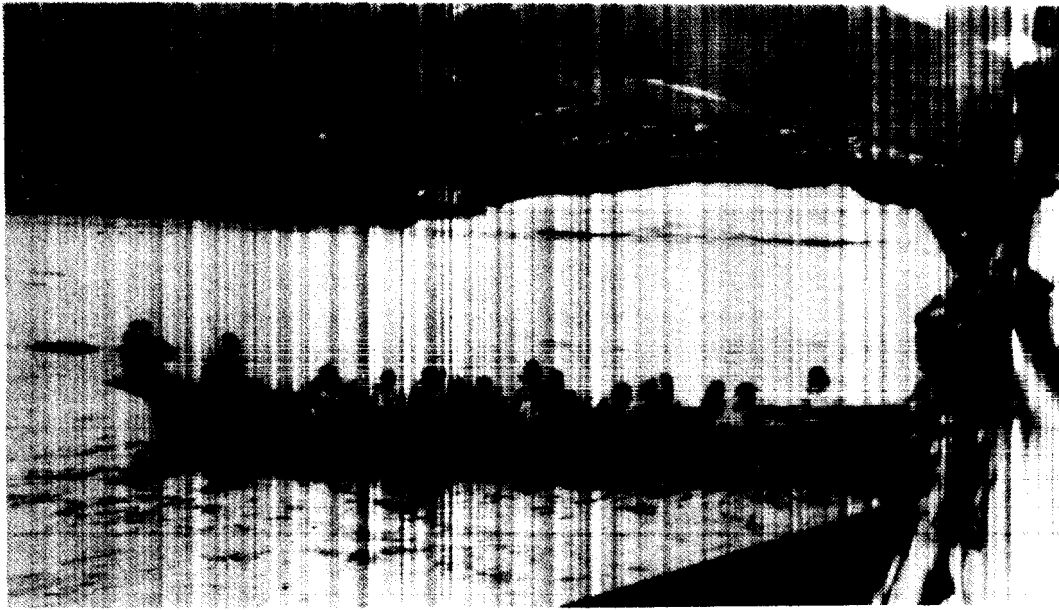


Figure 9. Native skin boats (umiaks) in the offshore coastal waters of Naukan.

C. Land Transportation

Overland transportation on the Chukotsk Peninsula is restricted almost entirely to the winter season, when ice and packed snow provide a firm surface for travel. The land-fast ice along the coast is also used. Dog teams are the chief means of locomotion, although some reindeer-drawn sleds are also used. Tractor-drawn sleds are used locally to haul supplies and equipment from coastal receiving points to nearby Soviet installations. In the vicinity of the Soviet military installations at Uel'kal' and Provideniya/Urelik, there are evidences of relatively heavy motor vehicular traffic. In summer the water-logged ground of the tundra is, for the most part, impassable except along established foot trails, tracks, or roads.

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According to pre-World War II information, a number of reindeer migration routes follow the river valleys. ^{21/} In spring the Reindeer Chukchi of the interior move their herds along these valleys from the interior of the peninsula to pastures along the coast; in the fall the herds return to the interior. The valleys are generally the best routes between the interior and the coast.

Roads and trails are few and generally short. Most of them connect Soviet installations with the coast or with adjacent native villages. Although the road between Uelen and Dezhnev is only about 14 kilometers (9 miles) long, it is one of the two longest roads in the region. A recent Soviet map shows the second road as circling the northern end of Bukhta Emma and connecting Provideniya with Urelik. ^{22/} From Urelik the road continues southwestward to Plover as a secondary road.

V. Terrain and Hydrography

The Chukotsk Peninsula is a mountainous region with many low pyramidal and rounded peaks separated by broad, tundra-covered valleys. Within the tundra are many shallow lakes and knee-deep bogs filled with moss and water. Permafrost is found from 0.3 to 2 meters (1 to 7 feet) below the ground surface. In their upper courses, rivers flow swiftly through steep valleys. On reaching the lowlands the rivers slow down and develop meanders. Moraines, cirques, and fiords are common features of the glaciated landscape. Firm sand and gravel beaches are scattered along the coast of the peninsula.

The peninsula can be divided roughly into six terrain regions: (A) the Northeastern Mountains, (B) the Central Mountains, (C) the Southeastern Fiords, (D) the Ioniveyem-Khel'khymleveyem Depression and Eastern Coastal Lowlands, (E) the Northern Coastal Lowlands, and (F) the Zaliv Kresta Lowlands (see map). Of these the first three are predominantly mountainous; the remainder are lowlands.

A. Northeastern Mountains

The Northeastern Mountains comprise the eastern end of the Chukotsk Peninsula, where it approaches closest to the North American Continent. On the southwest the region is separated from the Central Mountains by the Ioniveyem-Khel'khymleveyem Depression, and to the north is the Northern Coastal Lowland. The region consists of a series of mountain ranges separated by wide, marshy valleys. The mountains average 700 to 750 meters (2,300 to 2,500 feet) in elevation, with individual peaks rising over 800 meters (2,600 feet). The intermontane valleys are dotted with lakes. The largest is Ozero (lake) Koolen', 16 kilometers (10 miles) long and 1.5 kilometers (0.9 mile)

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wide, which occupies the upper valley of the Uusenveyem River (Figure 10). In general the mountains become lower to the east, and the valleys broaden out. Most of the coastline is steep, in places dropping off abruptly to the sea. At Mys Serdtse-Kamen' in the north, the nearshore water is 9 meters (30 feet) deep and contains rock pinnacles and large submerged rocks. Along the coast are numerous bays backed by relatively wide, sandy beaches. From several of the bays, broad valleys provide access to the interior.

Within the Northeastern Mountain region, there are several areas in which the terrain differs appreciably from that of the region as a whole. These areas are (1) the Littoral Range, (2) the Dissected Foothills Plateau, (3) the Vet'khvavaam Depression, (4) the Inchoun-Uelen Lowland, (5) the Dezhnev Massif, (6) Zaliv Lavrentiya Fiord, and (7) the Khrebet (range) Teniany.

1. Littoral Range

The Littoral Range is one of the most prominent terrain features of the region, bordering the coast from Seshan in the north to Enmytagyn on the south and extending inland for about 12 kilometers (7 miles). The range consists of hills that average 300 meters (1,000 feet) in elevation. At the northwest end of the range the peaks merge with other low mountains to the west. The areas between Chutpen and Uten are the most rugged parts of the range. In the southeast the range ends abruptly at the edge of the Inchoun-Uelen Lowland. Below the range the coast consists of talus slopes and narrow beach strips that provide occasional landing sites. Small streams drain the seaward slopes and enter the ocean as waterfalls or cascades.

The Chegitun' River is the only stream that crosses the Littoral Range. In cutting its way through the range the Chegitun' has carved a deep, V-shaped gorge 110 meters (360 feet) deep, 100 meters (330 feet) wide, and over 12 kilometers (7 miles) long. Below the gorge the river is bordered by terraces (Figure 11). Larger motor launches can navigate beyond the gorge up to the point where the river becomes shallow and choked with sandbars.

2. Dissected Foothills Plateau

The northern half of the Littoral Range is backed by the Dissected Foothills Plateau, which extends from the Chegitun' River on the southeast to the mountains on the northwest. The plateau has a northeast-southwest trend and measures about 35 kilometers (22 miles) in length and 18 kilometers (11 miles) in width. The surface consists of glacial deposits surmounted by small, rounded peaks that

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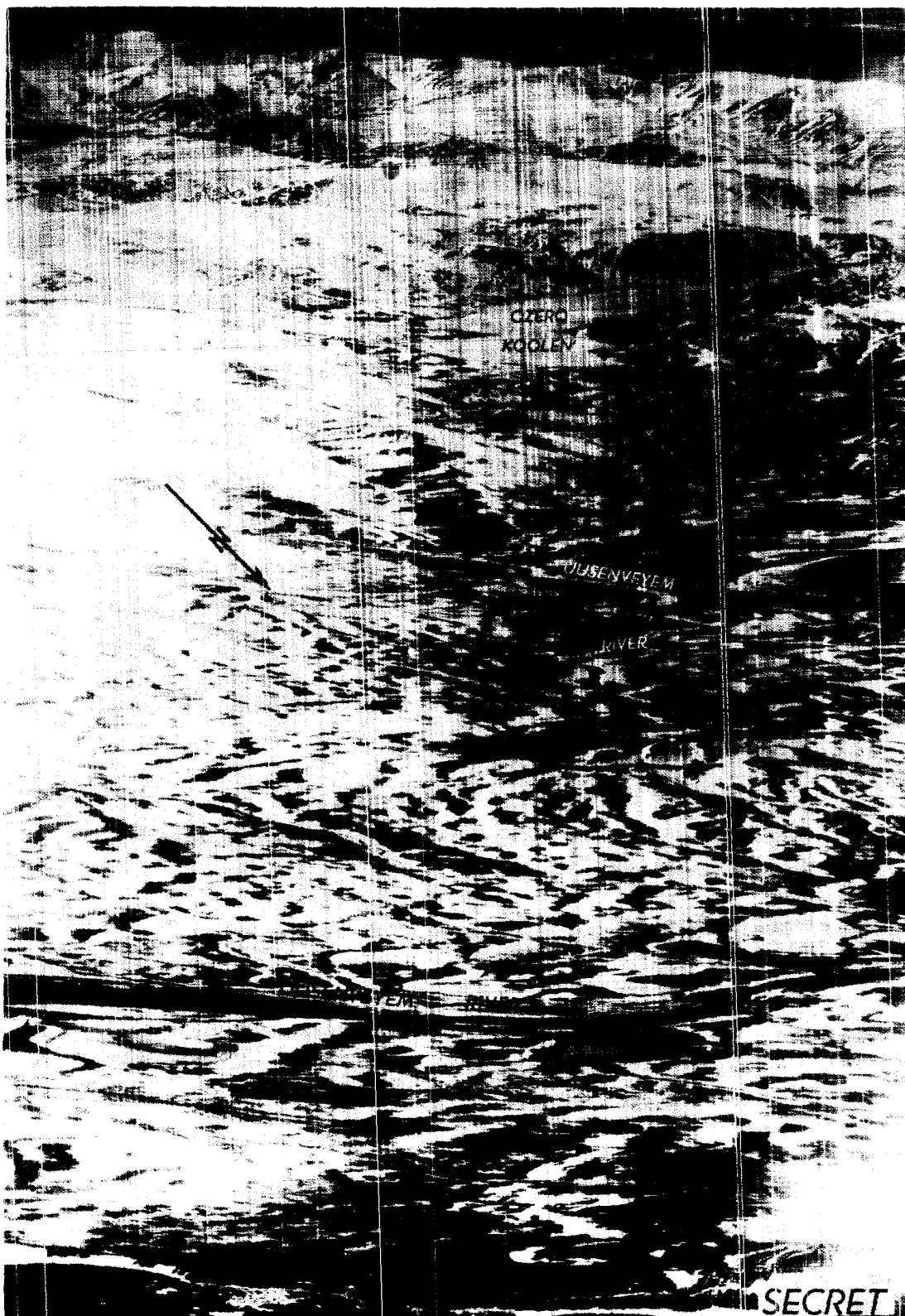


Figure 10. The meandering Uusenveyem River, which flows out of Ozero Koolen'.

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rise 100 to 250 meters (330 to 820 feet) above sea level. Among the evidences of glaciation are many small cirques, hanging valleys, glacial lakes, and moraines. The rivers have cut deep valleys into the surface of the plateau, and on the valley slopes are evidences of old river terraces.

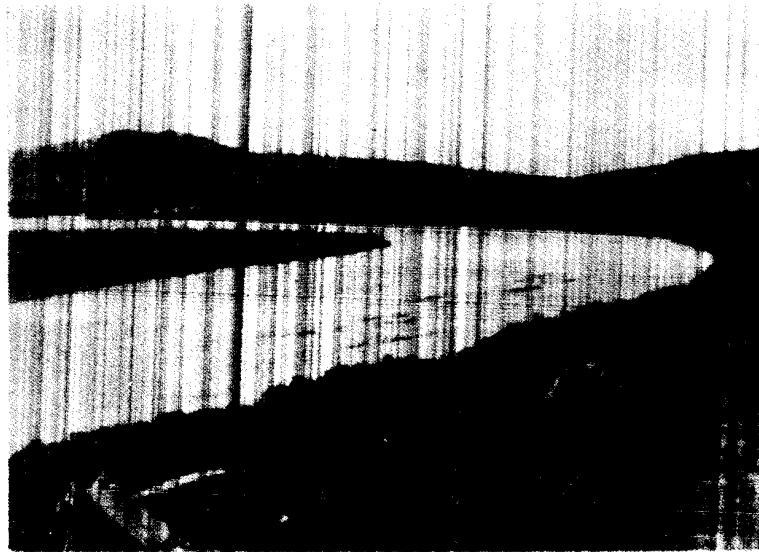


Figure 11. Gravel terrace bordering the lower course of the Chegitun' River.

3. Vet'khvavaam Depression

The Vet'khvavaam Depression, a broad glaciated valley 4 to 5 kilometers (2.5 to 3 miles) in width, parallels the southern half of the Littoral Range for 35 kilometers (22 miles) (Figure 12). The surface of the depression consists of glacial deposits. Midway along the depression is the divide between the Vet'khvavaam, a tributary of the Chegitun', and the Utaveyem, a tributary of the Inchoun River. The divide is a marshy, lake-dotted area 50 to 60 meters (160 to 200 feet) above sea level.

4. Inchoun-Uelen Lowland

The Inchoun-Uelen Lowland is approximately 45 kilometers (28 miles) long and extends 25 kilometers (15 miles) inland between the Littoral Range and the Dezhnev Massif. The marshy lowland contains low, flat-topped hills that are partly covered with morainic

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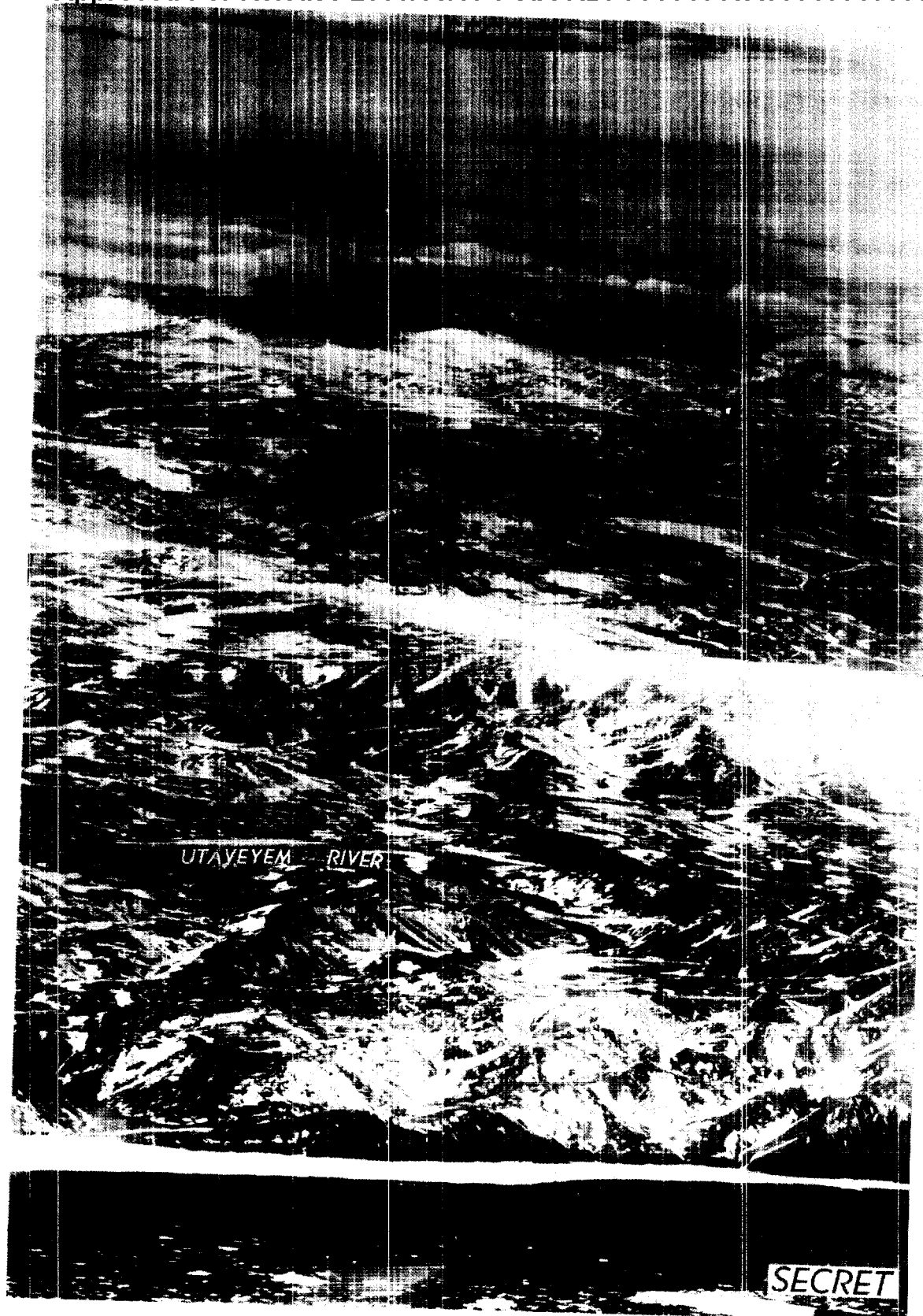


Figure 12. In the foreground is the western part of the Vet'khvavaam Depression and the Utaveyem River.

deposits. Two principal rivers meander across the lowland -- the Inchoun emptying into Laguna Inchoun and the Uusenveyem into Laguna Uelen. The lagoons are separated by an arch of low hills that reach their maximum height of 400 meters (1,300 feet) at Mys Intsova. The Inchoun River, which is the principal source of water for Laguna Inchoun, originates high in the mountainous interior. In its upper course the river flows swiftly through a glacial valley. After the Inchoun leaves the mountains, it is joined by the Utaveyem and becomes a wide, shallow river that flows through a valley 3 kilometers (2 miles) in width. Farther downstream, it meanders slowly across the lowland and terminates at a large, lake-dotted delta facing the lagoon. Several smaller streams also flow into the lagoon from the surrounding lowland.

Laguna Inchoun is 5 kilometers (3 miles) wide at its mouth and extends 14 kilometers (9 miles) inland. A sand and gravel spit 200 to 300 meters (660 to 1,000 feet) wide and 20 meters (66 feet) high separates the lagoon from the sea. Access to the lagoon is provided by a channel 120 meters (390 feet) wide and 5 meters (16 feet) deep. Within the lagoon the depth of the water varies from 1 to 7 meters (3 to 23 feet).

Southwest of the lagoon entrance is Ostrov Vokhodno, a small, flat-topped island 2 kilometers (1 mile) long and 1 kilometer (0.6 mile) wide, which rises to an elevation of 18 meters (60 feet). The northwest shore of the island has a gravel beach; along the remainder of the coast, the land slopes abruptly to the water. Shallow-draft boats can land anywhere on the coast.

Laguna Uelen parallels the coast for 20 kilometers (12 miles) between Mys Intsova and the Dezhnev Massif. On its western margin, an arm extends inland for 7 kilometers (4 miles). Entrance to the lagoon is through a break 180 meters (600 feet) wide near the western end of the coastal spit. At the entrance the water is 2 meters (7 feet) deep. Although the maximum depth of the lagoon is 8 meters (26 feet), most of it is shallower, and many low, sandy islands and shoals protrude above the water. Nearshore bottom slopes along the spit are steep in the vicinity of Uelen settlement. At a distance of 1.5 kilometers (0.9 mile) offshore, depths range up to 17 meters (55 feet). The spit is exposed to north winds, however, and freighters must anchor a considerable distance from the shore.

5. Dezhnev Massif

Dezhnev Massif, the easternmost point of the Chukotsk Peninsula, is a mass of dark, granitic rock that is joined to the mainland by the southeastern part of the Inchoun-Uelen lowland. The massif

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risers almost perpendicularly from the sea to a maximum elevation of 800 meters (2,600 feet) (Figure 5). The 20-meter (66-foot) isobath closely parallels the shoreline, and the water offshore is 25 to 44 meters (82 to 144 feet) deep. Small, rocky pinnacles in the coastal water, however, present hazards to navigation (Figure 13). South of Mys Dezhneva, at the settlement of Naukan, the coastal hills descend more gently to the sea, and along the shore is a sand and gravel beach 12 to 15 meters (40 to 50 feet) wide at which small craft can land (Figure 7). At the southern extremity of the Dezhnev Massif the coast becomes steeper, and at Mys Peyek cliffs rise abruptly above the water.

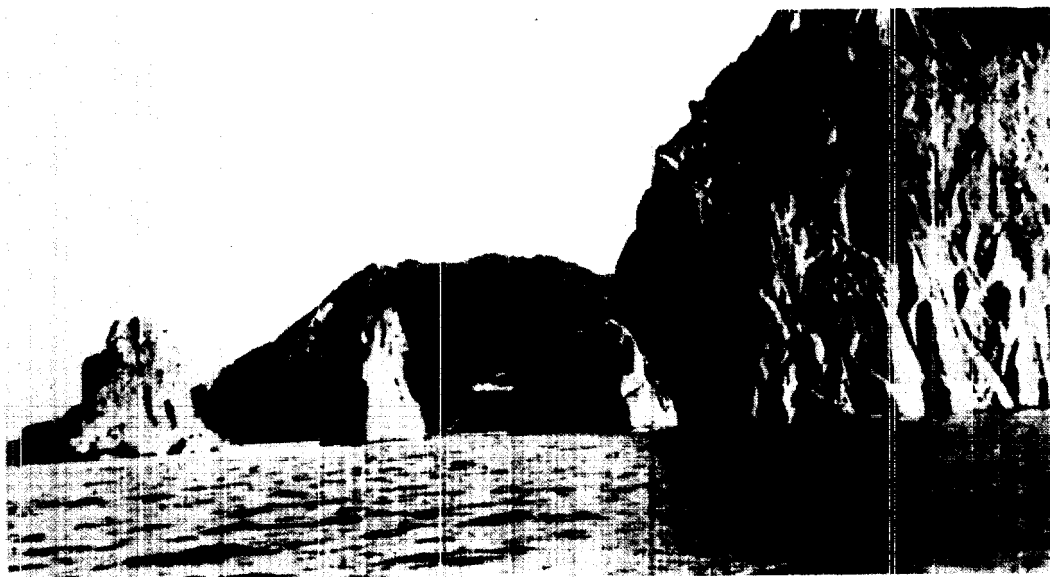


Figure 13. Rocky pinnacles in the nearshore water at Mys Dezhneva.

6. Zaliv Lavrentiya Fiord

Zaliv Lavrentiya pierces the eastern coast of the Chukotsk Peninsula and forms a narrow tongue of water extending 45 kilometers (28 miles) inland (Figure 6). It is bordered on the southwest by the high Khrebet Tenianyy and on the northeast by lower mountains. Terraces composed of boulders and gravel in a matrix of gray clay extend along both shores. The terraces range up to 7 kilometers (4 miles) in length and up to 11 meters (36 feet) in height. The bay is 5 kilometers (3 miles) wide in its upper and middle portions and broadens out to 20 kilometers (12 miles) between Mys Nunyamo and Mys

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Yandogay in the south. The bottom sediments consist of sand and mud. The tidal range in Zaliv Lavrentiya is 0.3 meter (1 foot), but stormy weather may change the water level as much as 1 meter (3 feet).

The floor of the fiord, like that of many other fiords of the peninsula, is deepest in its middle stretch and becomes shallow in its upper and lower reaches. Depths vary from 15 meters (50 feet) at the entrance and head of the fiord to 120 meters (400 feet) near the middle.

Although the mountains southwest of the bay are higher than those to the northeast, the shore on the northeast is steeper. On both sides of the bay, snow-filled cirques are the sources of streams. The Koimatkevaam, after flowing through a broad valley, empties into the upper end of the bay, where it has formed a small delta with several distributaries. The Nunyamovaam parallels the northeast shore and enters the bay near the settlement of Nunyamo.

Within Zaliv Lavrentiya are several peninsulas and islands. The peninsulas are low and sandy, and the nearshore water averages 3 to 5 meters (10 to 16 feet) in depth. The largest island, Ostrov Benneta, lies in the upper part of the bay (Figure 6). It is 5 kilometers (3 miles) in circumference and is surrounded by shallow water. Southeast of the island is a shoal that lies 5 meters (16 feet) below the surface of the water. Ostrov Litke, 2 kilometers (1 mile) west of Pinaku, near the entrance to Zaliv Lavrentiya, is a small sand and gravel island 1 kilometer (0.6 mile) long and 2 meters (7 feet) above sea level. When the bay is frozen the island cannot be distinguished from the surrounding ice. Another small island, Ostrov Balka, is located 5 kilometers (3 miles) northwest of Ostrov Benneta.

7. Khrebet Tenianyy

Khrebet Tenianyy, the highest range in the Northeastern Mountains, extends for 70 kilometers (43 miles) in a northwest-southeast direction along the southern shore of Zaliv Lavrentiya. The range drops steeply to the bay on the northeast but slopes gradually southwestward to Guba Mechiginskaya. The peaks average 800 to 900 meters (2,600 to 2,950 feet) in elevation. Moraines and terraces are characteristic features of the stream valleys that penetrate the range.

Two mineral springs are found on the southeastern slopes of Khrebet Tenianyy near the upper Kukun River. These bubbling, gassy springs issue from the rocky ground at a temperature of 136°F. Their combined flow amounts to 75 liters per second (1,200 gallons per minute).

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B. The Central Mountains

The Central Mountains form the backbone of the peninsula. The region extends in a northwest-southeast direction from the Chukotskiy Khrebet (formerly called Anadyrskiy) complex of the mainland to the fiords at the southern tip of the peninsula. On the northeast the region is flanked by the Northern Coastal Lowland and by the Ioniveyem-Khel'khymleveyem Depression and Eastern Coastal Lowland. To the southwest are the Zaliv Kresta Lowlands and Anadyrskiy Zaliv. The Central Mountains average 500 meters (1,640 feet) in height but in places rise to over 1,000 meters (3,200 feet).

Khrebet Ys'katen', in the extreme west at the head of Zaliv Kresta, is the highest range and averages 1,200 to 1,300 meters (3,900 to 4,200 feet) in elevation, with individual peaks up to 1,500 meters (4,900 feet). The range extends north to the upper reaches of the Anguyema and Vankarem Rivers and east to the Vekelatvaam River. Along its northern flank, the range decreases gradually in elevation; the southern slopes are more abrupt. The peaks are chiefly gray and black pyramidal masses with blunt summits (Figure 14), but occasional mountains are of the alpine type with narrow, serrated peaks. Steep slopes plunge downward to boulder-strewn, flat-bottomed valleys containing moraines and river terraces.

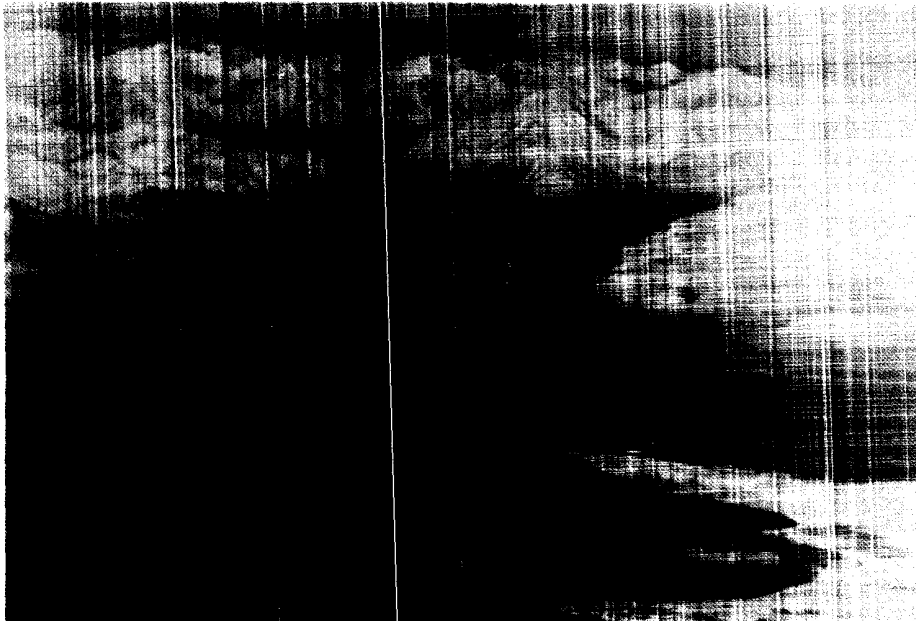


Figure 14. The steep, pyramidal peaks of Khrebet Ys'katen', with Zaliv Kresta in the foreground.

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From the south, several marshy U-shaped valleys lead inland through the mountains. Meandering streams drain these valleys and empty into small lagoons at the heads of Guba Etel'kuyum and Guba Kangynin. The upper courses of the Kycheneyveyem and Vekelatvaam Rivers contain remnants of ancient valley glaciers, which now cover an area of about 2 square kilometers (0.7 square mile).

The Vankarem River, which rises in the eastern foothills of Khrebet Ys'katen', flows northward through broad, glaciated valleys to the northern coastal lowland. The channel of the river is bordered by gravel terraces 40 meters (130 feet) in height.

Although the Anguyema River flows through the northern foothills of Khrebet Ys'katen', it originates high in the Chukotskiy Khrebet in the interior of the mainland. Glacial lakes and snow-filled cirques supply water to the river, which flows through a broad, boulder-strewn valley 8 kilometers (5 miles) wide. Throughout the valley are scattered morainic hills 30 meters (100 feet) high, and gravel terraces 80 meters (260 feet) high line the banks of the river. Near the foot of Khrebet Ys'katen', the valley widens to 15 kilometers (9 miles) and contains many lakes 3 to 4 kilometers (2 to 3 miles) in diameter. Farther downstream the lakes become smaller and fewer in number.

From Khrebet Ys'katen' the mountains continue for 250 kilometers (155 miles) to the southeast, becoming more gentle in form, with rounded summits. On the southern flank of the Central Mountains, short, swift rivers drain narrow valleys and empty into small lagoons and bays along a rugged coast. The northern rivers flow through wide, lake-dotted valleys towards the Northern Coastal Lowland.

The southern coast between the Zaliv Kresta Lowlands and the Southeastern Fiords is made up of abrupt coastal headlands separated by river valleys and lagoons. Among the larger of these embayments is the lagoon at Epryan. A low sand and gravel spit separates the lagoon from the sea. At the west end of the spit, a narrow channel provides an entrance to the lagoon. The valley of the Seutaken River at the head of the lagoon is 7 kilometers (4 miles) wide. In its lower course, this river divides into several interconnecting channels.

Fifty-five kilometers (34 miles) to the southeast is Bukhta Rud-der, a narrow, elongated bay formed by a spit 9 kilometers (6 miles) long. Two shallow streams, the Eruem and Yerguveyem, empty into the bay.

Farther along the coast is Bukhta Preobrazheniya, a bay 4 kilometers (3 miles) wide that extends inland 7 kilometers (4 miles).

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The mountains bordering this bay average 600 meters (2,000 feet) in height and descend steeply toward the sea (Figure 15). Abrupt bluffs line both sides of the entrance. Between Bukhta Preobrazheniya and Laguna Achchen a number of small streams flow through steep, terraced valleys directly to the sea.

Laguna Achchen, the largest embayment along the southern coast of the Central Mountains, is fed by several small rivers. A number of small distributary channels and deltas have formed where the rivers enter the lagoon.

Laguna Kuymenay, the easternmost embayment along the south coast of the Central Mountains region, receives the waters of the Kurupka and Val'karvaam Rivers. The upper Kurupka Valley has a width of 3 kilometers (2 miles) and broadens to 5 kilometers (3 miles) near the settlement of Kurupka. The river is 2 meters (7 feet) deep and forms a large marshy delta where it enters the lagoon. The Val'karvaam River is also about 2 meters (7 feet) deep but has a swift current and flows through a valley 10 kilometers (6 miles) in width. The river has cut a gorge 30 meters (100 feet) below the valley level.

C. The Southeastern Fiords

The Southeastern Fiords region occupies the southernmost tip of the Chukotsk Peninsula, southeast of a line drawn from Bukhta Pinkigney to the lagoon at Imtuk. From the standpoint of terrain, it is a continuation of the Central Mountains, differing from them chiefly in the nature of its coastline and the resulting military and economic development. The terrain of the region, with its deeply penetrating fiords and broad U-shaped valleys, shows the effects of glaciation more markedly than any other part of the Chukotsk Peninsula. Steep peaks rise to elevations of 800 to 1,000 meters (2,600 to 3,200 feet). The rivers are short and swift, but shallow and easy to ford. Even in summer, they are seldom deeper than 0.3 to 0.6 meter (1 to 2 feet). In some of the valleys there are terraces up to 50 meters (160 feet) in elevation. The major physical features of the area are described in the following paragraphs.

1. Bukhta Provideniya

Bukhta Provideniya is one of the longest and deepest fiords of the region, as well as the most important from the standpoint of Soviet installations. It extends 38 kilometers (24 miles) inland, is 2.5 kilometers (1.6 miles) wide at its midpoint, and broadens out to 14 kilometers (9 miles) at its mouth. The bottom sediments are sand and mud. The fiord is deepest, 150 meters (500 feet), north of the entrance to Bukhta Emma, a small eastern arm of Bukhta Provideniya.

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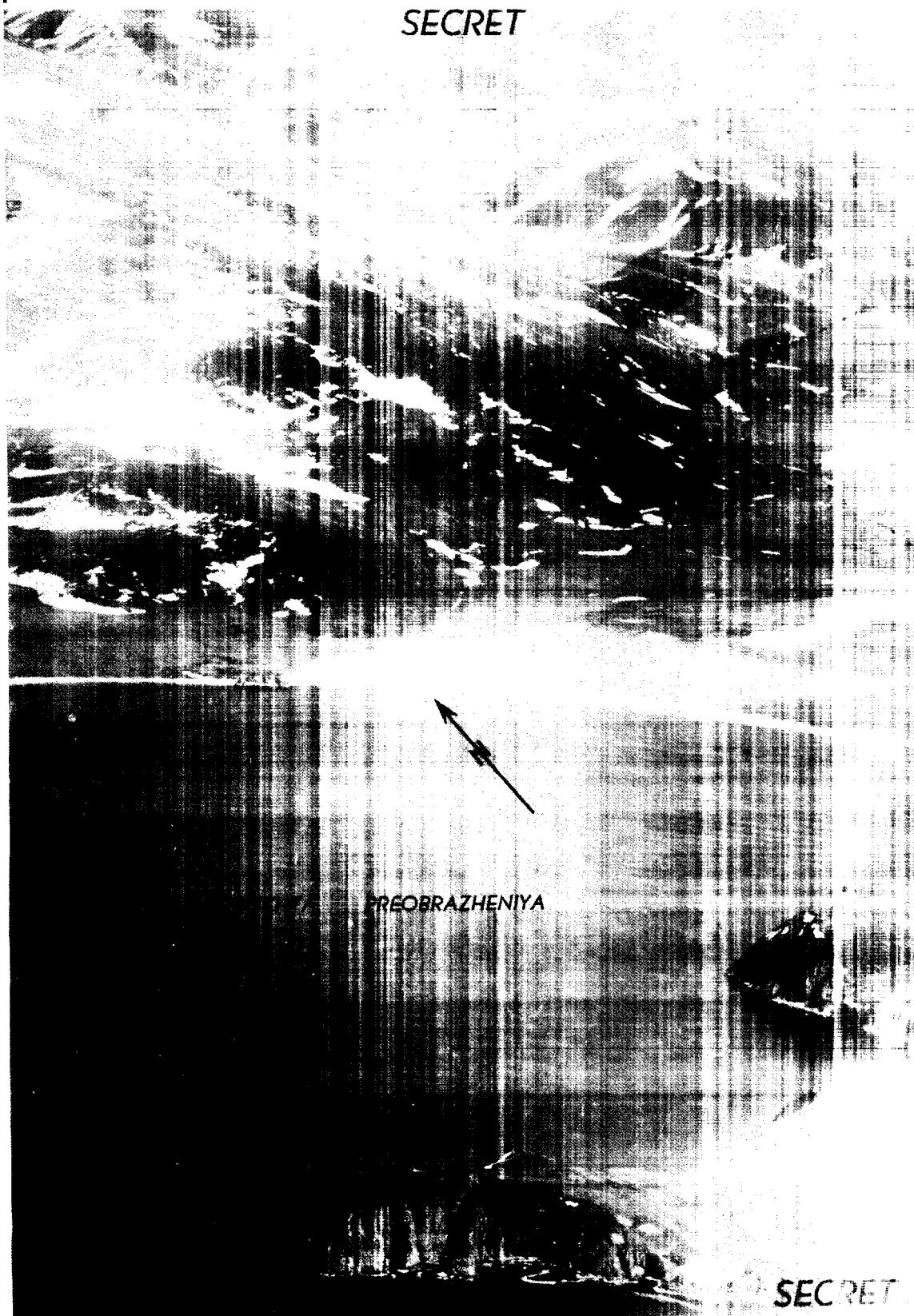


Figure 15. Bukhta Preobrazheniya on the southern coast of the Chukotsk Peninsula, with coastal mountains in the background.

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The mean tidal range is 0.6 meter (2 feet) in both Bukhta Provideniya and Bukhta Emma. At low water, tidal flats are exposed in the small indentations along the sides of the fiord.

The sheer walls of the mountains bordering Bukhta Provideniya are occasionally pierced by short, steep-sided, narrow valleys (Figure 16). In a very few places there are narrow beaches. On the east shore of the bay 10 kilometers (6 miles) from the mouth is a low, marshy, recurved spit. The spit is composed of gravel and shelters Reid Plover, a small harbor 20 meters (66 feet) deep.

2. Bukhta Emma

Bukhta Emma (Figure 4) is the only deep-water harbor on the peninsula. It is 3 kilometers (2 miles) wide and 5 kilometers (3 miles) long and has a maximum depth of 25 meters (80 feet). Entrance to the bay from Bukhta Provideniya is through a 1.5-kilometer (0.9-mile) gap in the mountains (Figure 17). Marshes and tidal flats border the northern and southern ends of the bay, and gravel beaches extend along the northwestern shore (Figure 18). Along the southern shore of Bukhta Emma are two small shallow lakes surrounded by shore terraces 2 meters (7 feet) high made of gravel and mollusk shells. Farther to the south in a glacial valley is the larger Ozero Avan', 11 kilometers (7 miles) long and 3 kilometers (2 miles) wide. This lake is separated from the sea by a narrow spit.

3. Bukhta Tkachen

Bukhta Tkachen is a deep, elbow-shaped fiord. It is 29 kilometers (18 miles) long, 5 kilometers (3 miles) wide and has a sandy bottom and a maximum depth of 155 meters (510 feet). A wide valley 5 kilometers (3 miles) long leads westward from the upper end of the bay towards Bukhta Emma. The remainder of the shoreline of Bukhta Tkachen is lined with cliffs that drop steeply to the water. The only beaches are a broad gravel stretch on the west side of the bay between Mys Plokiy and Chechen and a stretch on the north shore between Epyrgel'vin and Kytannay.

4. Poluostrov Chaplina

East of Bukhta Tkachen is Poluostrov Chaplina, a hilly peninsula that terminates in a triangular-shaped lowland at Mys Chaplina. This peninsula projects into the sea 10 kilometers (6 miles) and consists of flat, marshy, gravel terraces. A conspicuous feature of the lowland is Ozero Nayvan, a shallow brackish lake which, in addition to fresh water from the rivers, receives salt water from waves breaking over the shore during heavy seas. About 4 kilometers

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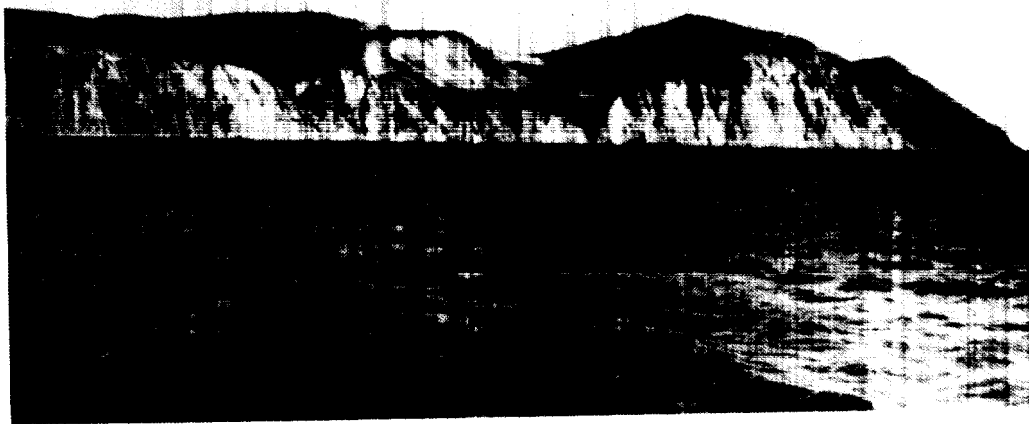


Figure 16. Abrupt cliffs on the eastern shore of Bukhta Provideniya. Short, steep valleys interrupt the cliffs in many places.

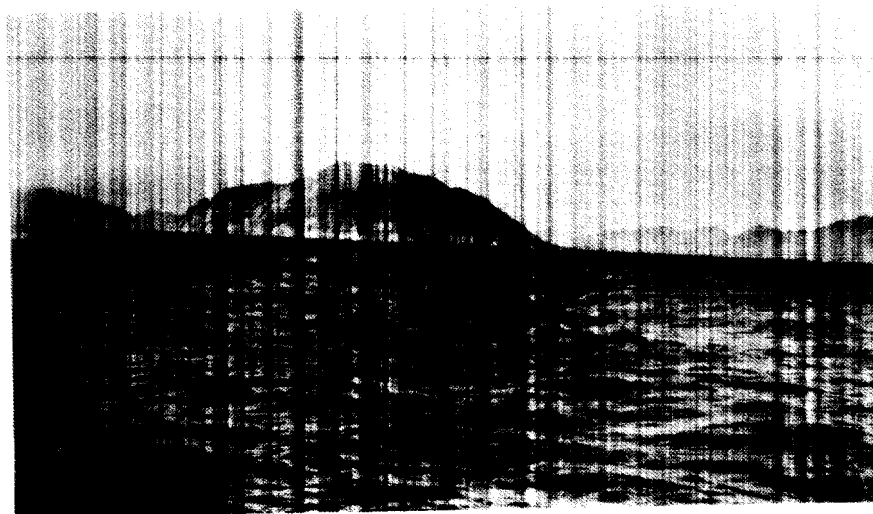


Figure 17. The central part of Bukhta Provideniya, with entrance to Bukhta Emma on the right.

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Figure 18. Wide gravel beach on the northern shore of Bukhta Emma.

(2.5 miles) inland, in a valley between Ozero Nayvan and the hills to the west, is a series of 15 mineral springs. Water issues from these springs at the rate of 5 liters per second (79 gallons per minute) at a temperature of 172°F. The waters are bitter and salty and smell like rotten eggs. The valley, sheltered from winds and warmed by the springs, supports a rich growth of grass.

5. Ostrov Itygran and Ostrov Arakamchechen

The fiorded coastline north of Poluostrov Chaplina is dominated by two large islands. Ostrov Itygran, 15 kilometers (9 miles) long and 8 kilometers (5 miles) wide, rises to a maximum elevation of 528 meters (1,730 feet). Most of the island has a steep shoreline. Depths of 60 meters (200 feet) are found immediately offshore, except along the eastern side where there are many shoals. East of the island is Ostrov Nuksagen, a small, rocky prominence with a shoreline 2.4 kilometers (1.5 miles) long. This small island rises steeply from the sea to an elevation of 100 meters (330 feet).

North of Ostrov Itygran is Ostrov Arakamchechen, a triangular-shaped island separated from the mainland by a deep, glacier-carved channel. The island rises gradually to a 620-meter (2,000-foot) peak near its center. Marshes and many small lakes cover the lowland on the eastern part of the island. Two kilometers (1 mile) northwest of Mys Gleniy a group of hot mineral springs flow from the left bank of a small stream. The springs warm the water of the stream and give it a slightly bitter, salty taste. The 18-meter (60-foot) isobath is generally 1.6 kilometers (1 mile) from the shore of the island except on the east side, where it swings 13 kilometers (8 miles) out to sea. Shoals are found in the water off Mys Kygynin.

6. Bukhta Pinkigney

On the mainland opposite Ostrov Arakamchechen is the long fiord Bukhta Pinkigney, which marks the northern limit of the South-eastern Fiords region. This fiord extends inland 29 kilometers (18 miles) and has a maximum width of 5 kilometers (3 miles). The mountains surrounding Bukhta Pinkigney average 520 meters (1,700 feet) in elevation and surround a broad U-shaped trough. The greatest depth in the fiord is 110 meters (360 feet), but in many places along the north and west shore there are shoals within 2 meters (7 feet) of the surface. Gravel beaches extend along both sides of the fiord except for an 8-kilometer (5-mile) stretch along the lower southern shore where the mountains drop steeply to the water. In this area nearshore waters attain depths of 85 meters (280 feet).

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About 1.5 kilometers (0.9 mile) south of Bukhta Pinkigney, near the settlement of Gil'mimyl', is a group of mineral springs located in a small stream valley. The water of the springs is colorless and odorless and has a temperature of 178°F. It contains radioactive elements and should not be drunk.

D. Ioniveyem-Khel'khymleveyem Depression and Eastern Coastal Lowland

The Ioniveyem-Khel'khymleveyem Depression and Eastern Coastal Lowland extends from Guba Kolyuchinskaya southeastward to Guba Mechignenskaya. In the south this narrow intermontane corridor broadens out and continues to the settlement of Vyekvyn as a broad coastal plain. The depression, which averages 20 kilometers (12 miles) in width between the Northeastern Mountains and the Central Mountains, includes the valleys of the Ioniveyem and Khel'khymleveyem Rivers. Except for several isolated cone-shaped hills, the surface of the depression is low and flat. The depression is poorly drained and contains many meandering streams and ponds or lakes that vary from 10 meters (33 feet) to 10 kilometers (6 miles) in length. Although the streams are swift and have rocky bottoms in their upper courses, they become slow and meandering when they reach the floor of the depression and have silty bottoms. A group of hot, radium-bearing mineral springs are located 15 kilometers (9 miles) west of the head of Guba Mechignenskaya.

Guba Mechignenskaya is a triangular-shaped bay that penetrates 80 kilometers (50 miles) into the southern part of the depression. Depths in the gulf vary from 6 meters (20 feet) near the entrance to 2 meters (7 feet) at the upper end. Along the northeastern shore is a high, steep bluff; elsewhere the shore of the bay slopes gradually to the water. Low, flat Ostrov Ilir lies a short distance off the southwestern shore. The bay is separated from Bering Strait by two long, narrow spits. They are composed of gravel terraces that rise to 30 meters (100 feet) in height at Laren. The western spit encloses a large lake.

Between Guba Mechignenskaya and Laguna Getlyanen is a broad, marshy, lake-dotted plain with low hills. The coastline is smooth, interrupted only by the entrance to two lagoons. Laguna Getlyanen is a narrow, shallow lagoon that extends 24 kilometers (15 miles) inland.

25X1D0a [REDACTED] the spit separating it from the Bering Strait now forms a continuous barrier across the mouth of the lagoon. 23/ The principal tributary of the lagoon is the Getlyanen River which meanders across the lowland and forms a delta at the western end of the lagoon. Laguna Nygligan, a small lagoon to the south, is fed by the Vykvynayvaam River.

E. Northern Coastal Lowland

The Northern Coastal Lowland extends along the Chukotsk Sea from the vicinity of Takokagyn southeast to Netten. It reaches inland to the foothills of the Northeastern and Central Mountains, including the extensive Amguyema, Vankarem, and Kolyuchinskaya lowlands. The Northern Coastal Lowland is dotted with isolated hills and small lakes. The hills rise 100 to 300 meters (330 to 1,000 feet) to flat summits. Scattered among the hills are recently extinct volcanic cones (Figure 19). The lakes tend to be circular and range up to 300 meters (1,000 feet) in diameter and 120 meters (390 feet) in depth (Figure 20). The major streams such as the Amguyema and Vankarem are broad and sluggish. They meander across a marshy plain and empty into the coastal lagoons. Numerous islets dot the courses of the streams and divide them into two or more channels.

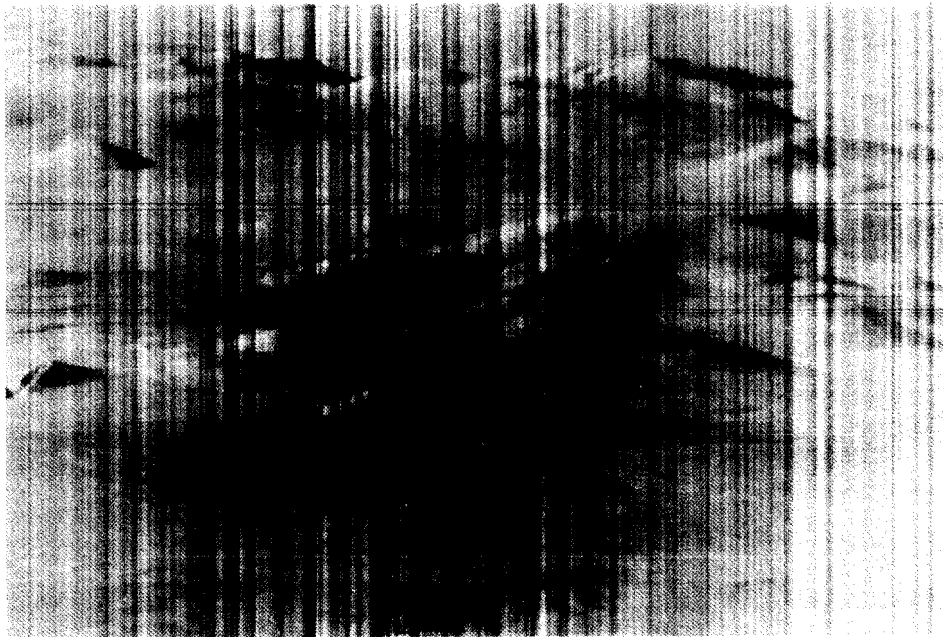


Figure 19. Low hills and extinct volcanic cones south of Laguna Pyngopil'khyn, viewed from the air.

A series of lagoons, separated from the sea by narrow gravel spits, dominates the coastline. Some of the lagoons extend along the coast for as much as 35 kilometers (22 miles). The lagoon formed at the mouth of the Amguyema River is separated from the sea by Kosa Dvukh Pilotov, a narrow spit 10 kilometers (6 miles) long containing

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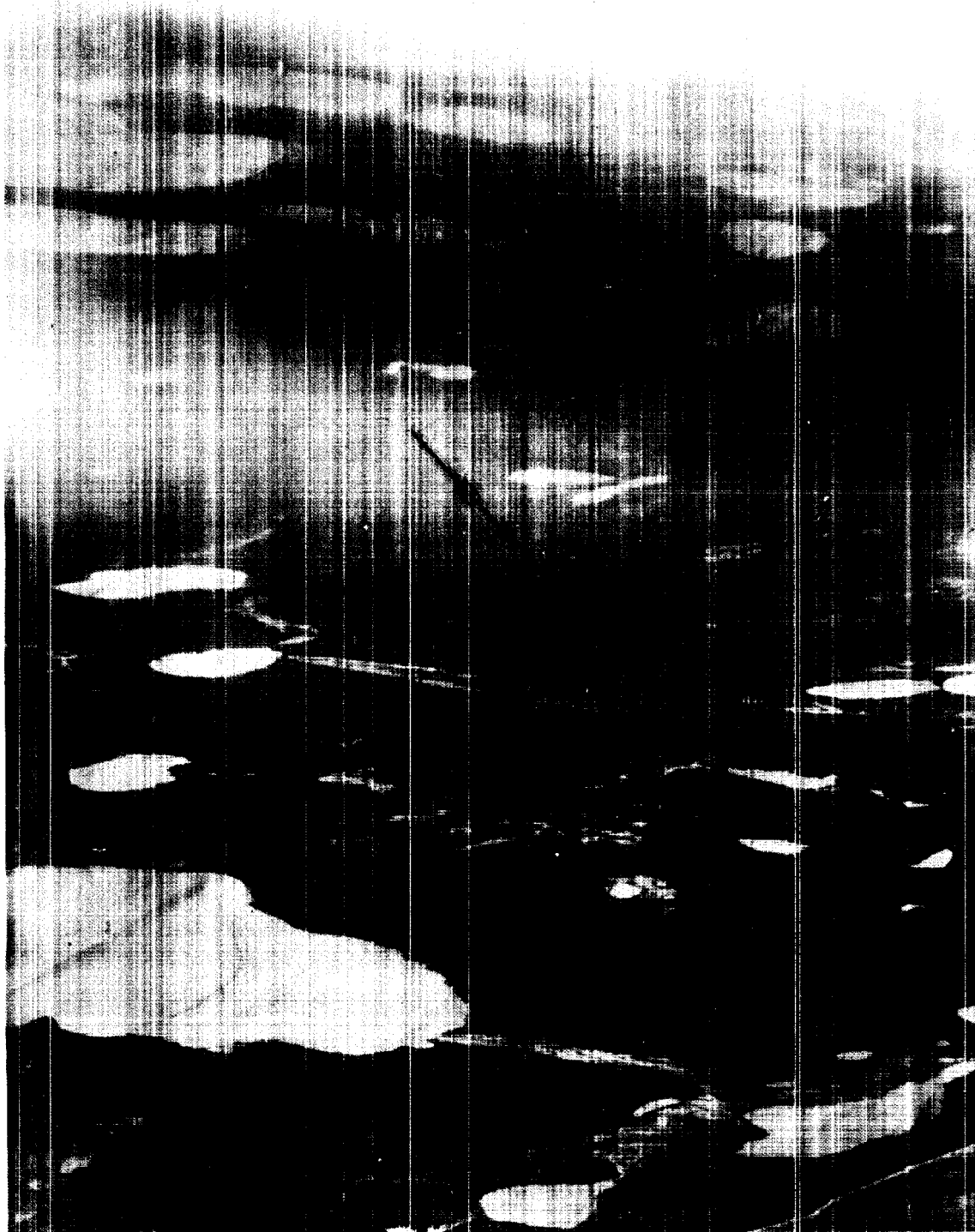


Figure 20. The flat, lake-dotted tundra along the northern coast of the Chukotsk Peninsula near the village of Nutepynmyn.

several small, fresh-water lakes. The nearshore depth of the water at the spit is 1 meter (3 feet). Within the lagoon, depths also average about a meter, and many sandy flats appear above water at low tide. The inlet to the lagoon is 3 kilometers (2 miles) wide and is divided into two channels by Ostrov Lena. Ostrov Lena rises 16 meters (52 feet) above the water. The channel to the west of the island is 7 meters (23 feet) deep and is the main entrance to the lagoon. Northeast of Ostrov Lena, shoals and low sandy islets project above the water. The channel through these shoals and between Ostrov Lena and the east end of the lagoon is 3 meters (10 feet) deep. The Amguyema River is reported to have a depth of 1 to 1.5 meters (3 to 5 feet) for 80 kilometers (50 miles) upstream. Kayaks and umiaks can ascend the stream 240 kilometers (150 miles).

Laguna Ukougepil'khyn is a shallow lagoon entered through a channel 150 meters (500 feet) wide and 3 meters (10 feet) deep. The meandering river which empties into its southern end has scoured a channel 2 meters (7 feet) deep within the lagoon. Small spits, which project from the low shores of the lagoon, contain many shallow, fresh-water lakes.

Laguna Nut is the rectangular-shaped lagoon 15 kilometers (9 miles) southeast of Laguna Ukougepil'khyn. The lagoon is entered through a narrow, shallow channel between two parallel spits. Near the eastern end of the lagoon, sandy islets appear above the water. Several short, meandering streams empty into the lagoon.

Laguna Vankarem, the drowned mouth of the Vankarem River, is one of the largest lagoons on the Chukotsk Peninsula. It extends inland 13 kilometers (8 miles) and then swings sharply to the southeast for 55 kilometers (34 miles). The entrance to the lagoon is 550 meters (1,800 feet) wide and 9 meters (30 feet) deep. Tides flow through the entrance channel with great speed. Within the lagoon the maximum depth is 3 meters (10 feet) and shoals are numerous. Mys Vankarem (Figure 8), west of the lagoon entrance, has a steep, rocky coast with large, submerged granite blocks in the deep nearshore water. The small bays on both sides of the cape are exposed to north winds and offer poor anchorage. Gora (mountain) Vankarem, 243 meters (800 feet) in elevation, lies west of Laguna Vankarem. It is one of the conspicuous relief features of the coastal lowland.

Southeast of Mys Vankarem is small crescent-shaped Ostrov Karkarko. The side facing the mainland is low, flat, and sandy, whereas the opposite side drops abruptly to the sea.

Between Laguna Vankarem and Mys Onman the coast is low and contains many small lakes and lagoons. Driftwood is frequently found

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floating in the nearshore water or lying on the gravel beaches. Mys Onman, which projects 3 kilometers (2 miles) from the coast, has bluffs up to 125 meters (410 feet) in elevation.

Sixteen kilometers (10 miles) southeast of Mys Onman is Laguna Pyngopil'khyn. This triangular-shaped lagoon has an entrance channel 250 meters (820 feet) wide and 3 meters (10 feet) deep. Within the lagoon, numerous shoals emerge at low tide. The Linatkhyrvuvaam River empties into the southern part of the lagoon.

East of the entrance to Laguna Pyngopil'khyn is Ostrov Kolyuchin, a bare, rocky island. It is 4 kilometers (3 miles) long and 1 kilometer (0.6 mile) wide, and rises to a flat summit 230 meters (755 feet) above the sea. The northern shore of the island is steep and rocky.

On the mainland between the Linatkhyrvuvaam River and Guba Kolyuchinskaya is a range of low hills that extends south from Laguna Pyngopil'khyn to the foothills of the Central Mountains. The flat summits of these hills range up to 200 meters (660 feet) in height. Scattered among the hills are many small extinct volcanic cones (Figure 20).

In the offshore water, a chain of small islands parallels the coast and extends to the entrance of Guba Kolyuchinskaya. This group of islands, known as Ostrova Serykh Gusey, forms the eastern boundary of Laguna Kunergvin. Several small lakes dot the gravel-covered surfaces of the islands. Along the western side of the islands are numerous shoals.

Guba Kolyuchinskaya is the largest gulf of the Chukotsk Peninsula. It is 48 kilometers (30 miles) wide and extends 96 kilometers (60 miles) inland. The main entrance to the gulf is 1.6 kilometers (1 mile) wide and 27 meters (90 feet) deep, and has a sandy bottom. Tides at the entrance to the gulf are swift. Depths within the gulf are only 7 to 14 meters (23 to 46 feet) and toward the western shore decrease to less than 1 meter (3 feet). The bottom is silty, with exposed sand banks in the northwest. The western and southern shores drop sharply to the bay. Portions of the eastern shore are also steep, consisting of terraces 10 meters (33 feet) high. In the south, Guba Kolyuchinskaya terminates in two smaller bays, each about 35 kilometers (22 miles) in length. The entrance to these southern extensions is partially blocked by Mys Kaynyk.

The coastline east of the mouth of Guba Kolyuchinskaya sweeps smoothly to Mys Dzhenretlen, a low cape with a steep, rocky shore. Beyond Mys Dzhenretlen the coastline is interrupted by several lagoon outlets. Laguna Neshkenpil'khyn, the longest lagoon on the Chukotsk

Peninsula, parallels the coast for 48 kilometers (30 miles) and extends inland 26 kilometers (16 miles). The entrance is 500 meters (1,640 feet) wide and 2 meters (7 feet) deep. The lagoon contains many shoals and at low tide extensive areas emerge above water. The northern periphery of the lagoon is marked by two parallel spits separated by a long narrow stretch of water.

A group of mineral springs similar to those found elsewhere on the peninsula is located 8 kilometers (5 miles) south of Laguna Neshkempil'khyn, at the base of rolling hills. The colorless, bitter, saline waters have a temperature of 131°F. They have a hydrogen sulfide odor and contain radioactive radium and thorium.

F. Zaliv Kresta Lowlands

Extensive lowlands surround the eastern and western shores of Zaliv Kresta. The eastern lowland is a plain that extends from low coastal cliffs inland to the foothills of the Central Mountains. This marsh- and lake-covered plain varies in width from 16 kilometers (10 miles) at Nutapenman to 40 kilometers (25 miles) at Mys Konergino. Small rivers with many shallow tributaries meander across the plain and empty into lagoons at the shore.

Kosa Meyechken, a narrow, gravel offshore bar, parallels the southern shore of the lowland along Anadyrskiy Zaliv. The bar is 77 kilometers (48 miles) long, 10 meters (33 feet) high, and 50 to 100 meters (160 to 330 feet) wide. On both sides of the bar the water is shallow, with depths between the bar and the mainland being less than 2 meters (7 feet).

The western lowland extends inland 40 kilometers (25 miles) to a range of low mountains on the mainland. The coastline consists of low, steep cliffs separated by long expanses of sandy beach. The lowland contains many lakes; the largest is located west of Uel'kal' and is fed by the Tyngueveyem River.

Zaliv Kresta is a wide bay with various depths. The maximum depth of 76 meters (250 feet) is found in the middle; depths decrease rapidly toward the north and northeast. Guba Kangynin in the northeast has a depth of 13 meters (40 feet), with a clearance of less than 1 meter (3 feet) over the shoals along the shore. The tidal range of this bay and of Guba Etel'kuyum to the west is 2.5 meters (8 feet). Shallow water continues southward along the east shore of Zaliv Kresta to Mys Erulya. From this point to Mys Konergino the shore is high and steep. Water depths here average 24 meters (80 feet) a short distance offshore. The nearshore water from Mys Konergino eastward to the lagoon at Epyran is shallow.

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VI. Vegetation

The Chukotsk Peninsula supports relatively rich and varied vegetation. The lowlands, stream valleys, and the lower mountain slopes are the habitat of many species of herbaceous plants, shrubs, and trees. The high, wind-swept mountains are barren, except for lichens. In adapting to the extreme climate and permanently frozen subsoil, most of the plants have developed stunted forms, small leaves, and shallow roots. Although their annual rates of growth are slow, their seasonal cycles are completed quickly. Under the influence of the long summer daylight hours, plants grow and bloom in 3 to 4 weeks. Many push through the unmelted snow cover to burst forth in bloom.

There is only one known poisonous plant on the peninsula -- monkshood (Aconitum napellus). It has palmate leaves and flowers resembling a monk's hood. The blue or purple flowers, which bloom in July and August, are attached to a raceme stalk about 3 feet tall. Monkshood grows in marshy places and has been identified at Mys Litke, Bukhta Emma, and Plover.

A. Herbaceous Plants

Herbaceous plants grow in a variety of places, and the number of species is greater than that of any other types of plants. During the short growing season flowers bloom in profusion. Stonecrop, dryas, and cassiope grow on bare stony ground in small clumps 8 inches high. They have small white or pink flowers. Primroses, buttercups, pearl-weeds, and rockcress grow along sandy lake and sea beaches. Many meadow herbs not used for food also contribute to the colorful carpet of flowers. Asters, chrysanthemums, goldenrod, anemones, larkspurs, poppies, and rockjasmine bloom in a variety of colors. Stunted forms of sagebrush are also found in the meadows. In drier meadows and on alluvial soils, grasses and sedges are common. Foxtail grass, reed grass, bluegrass, festuca, and brome grow in these places. Sixteen species of carex, a common sedge, are found on the peninsula.

Several beach herbs are used for food. Scurvy grass (Figure 21A), a squat biennial, has leaves that are short, triangular, and peppery-flavored. Although the white population eats it, raw or cooked, as an antiscorbutic, it is not consumed by the natives. The root tubers of the Eskimo potato (Figure 21B) are palatable and nutritious when boiled. They are collected and stored in large quantities to supplement the winter diet. Stems and leaves of the sea purslane (Figure 21C) are cooked in soup or fermented to form a product similar to sauerkraut.

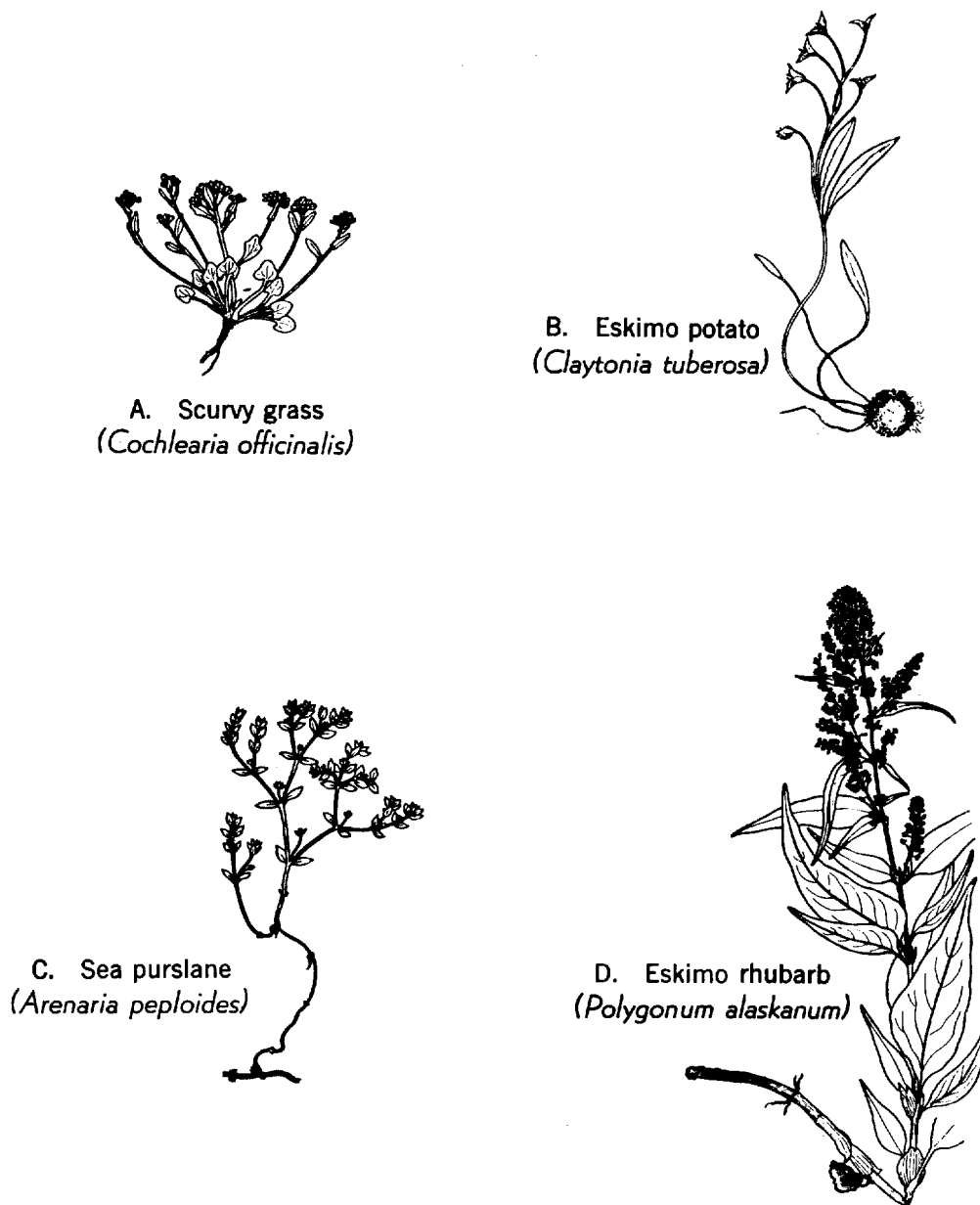


Figure 21.

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A number of plants that grow along stream banks are also eaten. The succulent, red stems and green leaves of Eskimo rhubarb (Figure 21D) are fermented and the root is cooked with meat. The tubers of the licorice-root, which mature in August, taste like young carrots. Angelica (Figure 22A) grows to a height of 3 to 7 feet in sheltered areas along streams. Its young, tender leafstalks and flowering stems are eaten raw. The roseroot (Figure 22B), whose thick, fleshy root smells like a rose, is found on stream banks and occasionally near the sea. The leaves and flower stem are considered delicacies by the natives and are eaten either raw or cooked.

A limited number of herbaceous species grow in the soggy marshes, and rushes are found in sandy areas adjacent to open water. Marestalk, a short aquatic herb with thick erect stems and short needlelike leaves, is a bog plant. The marsh-fleabane (Figure 22C), which grows in saturated soils and on lakeshores, has a clump of brilliant yellow flowers topping a stalk 4 feet high. The flowers and leaves are fermented, eaten raw, or cooked in soup. Leaves of the northern sweet coltsfoot (Figure 22D), a creeping perennial 18 inches tall, are eaten raw or cooked. In marshy areas of the southwestern part of the peninsula, seven species of cinquefoils are found. Their dried leaves are used as a substitute for tea.

Many species of herbaceous plants are native to the meadow-covered hillocks between the marshy lowlands of the interior. Several of these plants are used for food. The most ubiquitous is the dandelion, whose young leaves are eaten raw or cooked. Roots of the hairy fernweed and alpine bistort (Figures 23A and B) are eaten raw or in soup. The fernweed has a yellow root that tastes like a young carrot. The alpine bistort root is the size of an unshelled peanut and is rich in starch. Among the other plants with leaves that may be eaten cooked, fermented, or raw are mountain sorrel, round-leaved saxifrage, and arctic sourdock (Figures 23C, D, and E).

B. Berries

In the southern part of the peninsula, several species of berries ripen in late summer. All are edible and form a part of both human and animal diets. Berries of some species are not damaged by freezing and can be gathered after the snow melts in spring.

Black crowberry (Figure 23F), a short, matted, evergreen shrub, grows on sandy or rocky acidic soils. Its purplish-black berry is juicy and sweet but contains many large black seeds. The cloudberry (Figure 24A), which becomes a pale yellow and very juicy at maturity,

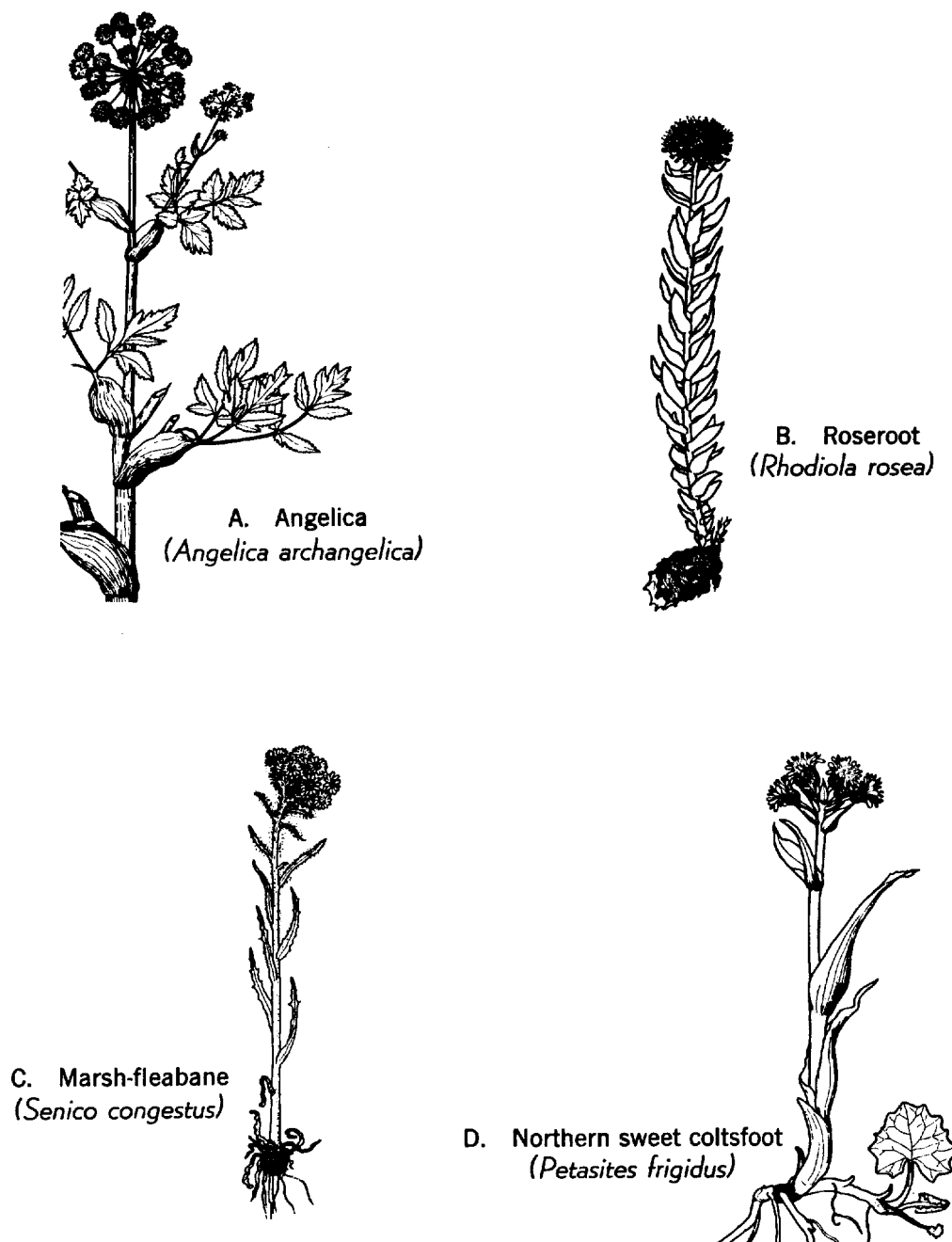


Figure 22.

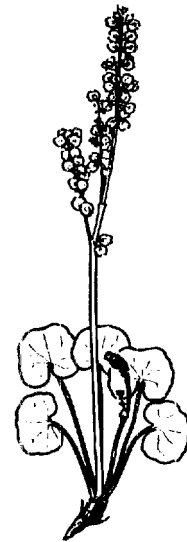
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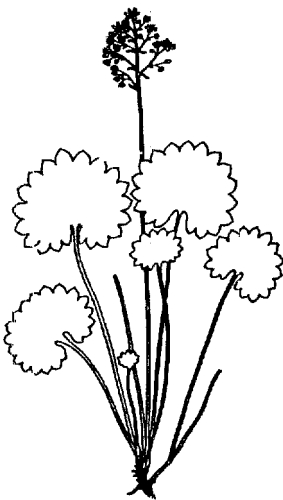
A. Hairy fernweed
(*Pedicularis sudetica*)



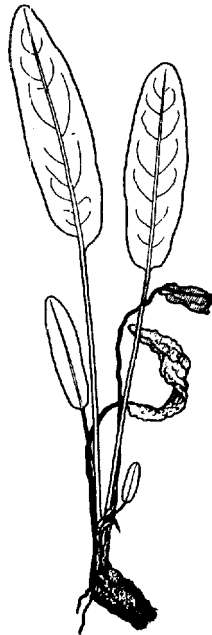
B. Alpine bistort
(*Polygonum viviparum*)



C. Mountain sorrel
(*Oxyria digyna*)



D. Round-leaved saxifrage
(*Saxifraga punctata*)



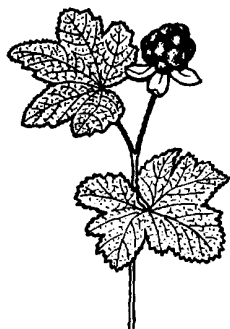
E. Arctic sourdock
(*Rumex arcticus*)



F. Black crowberry
(*Empetrum nigrum*)

Figure 23.

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A. Cloudberry
(*Rubus chamaemorus*)



B. Bilberry
(*Vaccinium uliginosum*)



C. Mountain cranberry
(*Vaccinium vitis-idaea*)



D. Reindeer moss
(*Cladonia rangiferina*)



E. Iceland moss
(*Cetraria islandica*)

Figure 24.

S-E-C-R-E-T

S-E-C-R-E-T

has antiscorbutic properties and is eaten fresh or cooked. The bilberry (Figure 24B) grows on a low, branching deciduous shrub, and has sweet, juicy bluish-black berries that ripen early in August. The mountain cranberry (Figure 24C), a low creeping bush with evergreen leaves, has tart dark-red berries that ripen in August and remain on the bush during the winter. By spring the berries have become much sweeter. An aromatic tea rich in vitamins can be made from leaves of the mountain cranberry.

C. Ferns, Lichens, and Mosses

Marshy areas abound in ferns, such as club moss, horsetails or scouring rush, and true ferns. Horsetails have nodular, sheathed leaves on jointed stems and grow 16 inches high. The other types of ferns are short creeping plants.

The rootless lichens grow in rocky areas unsuited for higher forms of plant life. Among the most common species on the peninsula are rock tripe, lungwort, reindeer moss, and Iceland moss. Reindeer and Iceland mosses (Figures 24D and E) are especially important since they comprise a large part of the caribou's diet. They have brown, gray, or gray-green branches and form low, bushy clumps 3 inches high. Both reindeer and Iceland moss can be eaten by humans, but they must be boiled to eliminate the bitter, acidic taste. The acid may cause nausea or even severe internal irritation.

Numerous species of mosses grow profusely in the moist tundra soils. Sphagnum or peat moss, which grows along the borders of lakes and ponds, is the most common. Gradually it fills in the water area, forming a knee-deep bog of decayed vegetable matter. Extensive areas of sphagnum bogs, which severely restrict movement on foot in summer, are found throughout the peninsula.

D. Shrubs

Several members of the heath family are native to the tundra. The moorwort, a low shrub with leathery evergreen leaves, has drooping pink flowers on terminal umbels. Alpine azalea grows as a prostrate shrub 12 inches tall. Rhododendron has dark evergreen leaves and white or pink flowers. On Ostrov Arakamchechen the shrubs reach a height of 7 feet.

E. Trees

The cold winds, scant precipitation, and shallow soils have reduced trees on the Chukotsk Peninsula to stunted, shrubby forms, which are found only in the stream valleys, ravines, and other

sheltered spots. Some of the trees have edible parts, and all of them are used for firewood by the nomadic Reindeer Chukchis (see Section II B). Thirteen species of willow grow on the peninsula. The buds and leaves of the East Siberian willow are rich in Vitamin C and are eaten in a fermented form. The inner bark of the roots is also used as food. Birch, alder, and dogwood are scattered throughout the interior of the peninsula.

VII. Animal Life

Despite the harsh living conditions, animal life on the Chukotsk Peninsula and in the adjacent waters is relatively abundant. In winter most of the animals hibernate or migrate, but a few species endure the bitter cold and remain throughout the entire year.

A. Mammals

Land mammals are found throughout the peninsula. Large colonies of East Siberian lemmings and northern pikas (rock rabbits) live in the grassy meadows of the coastal lowlands and in the interior mountains. These small rodents do not hibernate but remain in their burrows and consume grass and seeds cached during the summer. The weasel in his snow-white coat is active throughout the winter. Marmots dig burrows in grassy mountain meadows where they hibernate until June. The arctic fox, which is a smoky brown in summer, turns snow-white in winter. In winter the fox finds shelter in abandoned burrows of other animals and feeds on rodents it has buried during the summer. Its near relative, the red fox, sleeps on the bare snow, even during the severe winters.

Among the larger animals is the brown bear, which is found in the mountainous parts of the peninsula. In winter, it hibernates in the forested areas in the southwestern part of the peninsula, but during the summer the bear roams the tundra in search of small rodents, berries, and roots. Snow sheep are still seen occasionally in the mountains. The tundra wolf ranges throughout the tundra preying on smaller animals.

The most important land mammal on the Chukotsk Peninsula is the caribou, or northern reindeer, as the domesticated animals are called. Large herds of caribou still roam wild throughout the tundra. Both the wild and domesticated animals migrate with the seasons. During the summer, they move to the coast, where they graze on mosses, lichens, twigs, and berries. In winter, they return to the mountains for shelter.

The polar bear inhabits the coastal islands and ice floes, and preys on seal and fish. In the summer, it travels short distances

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inland in search of grass and berries. Otters inhabit the shores along lakes and lower courses of large rivers. The white hare, which changes color with the seasons, lives in burrows along steep stream banks.

Of the marine mammals that live either along the littoral or in deeper water offshore, the walrus is the most valuable from an economic standpoint. The natives use the meat and blubber for food, the hide for boats and tents, and the tusks for ornamental carvings. Mature males often weigh as much as 3,300 pounds. Walruses feed on mollusks, which they dig from the sea bottom with their long, curved tusks. They spend the winter along the ice edge south of the peninsula. When the ice breaks up, the animals migrate with the floes to breeding grounds where the young are born. These grounds are located at Kosa Meyechken, Ostrov Arakamchechen, Laguna Uelen Spit, and Mys Inchoun.

Among the other marine mammals are the bearded, striped, and arctic ringed seals, which inhabit the Chukotsk Sea coast during the summer and the adjacent ice in winter. They also furnish meat, oil, and skins for the native population. Large numbers of whales inhabit the coastal waters of the Chukotsk Sea and Bering Strait. The smallest, the white whale, is only 20 feet long, but humpback and Greenland whales reach 65 feet in length. The killer whale, which is found in the Bering Strait, is actually a dolphin. It travels in schools, which readily attack other dolphins, seals, walruses, and whales. The narwhal, which has a single twisted tusk up to 10 feet in length, is found in the Chukotsk Sea.

B. Fish

Since most rivers and lakes freeze to the bottom in winter, relatively few species of fresh-water fish are found on the peninsula. Among those that can survive are the burbot, which lives in lakes and rivers, and the nel'ma, which inhabits the lower courses of rivers.

The most important ocean fish is the whitefish. Although it is sometimes eaten by the natives, most of the people prefer meat to fish. The polar flounder, capelin, and arctic cod are found in the Bering Strait, and the goby and smelt abound in the Chukotsk Sea. The polar shark, which grows to a length of 7 feet, lives in the Bering Strait.

C. Birds

Birds make up the greatest number of animal species on the Chukotsk Peninsula. Most of the birds live along the shores. Sandpipers and snipes, including the northern and red phalaropes, have

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long, spindly legs that enable them to wade in the shallow shore water or in search of food. Red-throated and Siberian pipits are found at the seashore, as well as the ruddy turnstone that feeds along the littoral, turning over small stones in search of crustaceans, worms, and slugs. In winter, it migrates to Brazil and Chile. Several species of the plover, which migrate to Hawaii for the winter, are also found here.

The loon nests along the coast of the peninsula. Because of its inability to walk on land the loon keeps to the water most of the time. Other shore birds also spend most of their time over water, returning to land only to nest. The herring and blue gulls, with wingspreads up to 5 feet in width, patrol the seas, scavenging for food. Jaegers, fulmars, and arctic terns fly over the sea feeding on fish. Jaegers spend the winter on ice floes at sea. In winter the arctic tern migrates to Antarctica. The konyuga and the common murre (a guillemot) change to white plumage in winter. Puffins and guillemots nest in great colonies along steep shore cliffs. Eggs of the guillemots are eaten by the natives.

During the warm season, predatory birds are numerous. The peregrine falcon lives on coastal cliffs and preys on shore birds and rodents. The gyrfalcon, pigeon hawk, rough-legged hawk, and snowy owl are found throughout the peninsula. The largest predator is the white-tailed sea eagle, which has a wingspread of 5 feet.

Among the game birds of the peninsula are geese, ducks, and ptarmigans. White, gray, and snow geese nest in the marshy lakes scattered throughout the tundra. The barnacle goose lives along the seashore and feeds on barnacles. The old squaw and the eider duck are found on the littoral and feed by diving into the water for fish. The pochard, a large gray duck, also nests on the shore. Ptarmigans, found throughout the peninsula, change their brown-flecked summer garb to pure white in winter. For protection against the severe cold the birds are feathered down to their talons. Ptarmigans are easily caught because of their innate lack of fear.

Many songbirds inhabit the tundra during the summer but migrate to warmer climates in the winter. Among the most common are the horned lark and wheatear of the coastal shores and the longspurs, snow buntings, wagtails, and nightingales, which nest farther inland.

D. Insects

Although the number of species is relatively small, insects are numerous throughout the peninsula. They include beetles, bugs, and flies (including the housefly, blowfly, dancefly, and caddisfly). The

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greatest banes to humans, however, are the mosquitoes and midges. The countless pools of water and marshy areas form ideal breeding grounds for mosquitoes. Although the bites of the mosquitoes produce itching welts, they do not transmit malaria or yellow fever. Midges swarm about in large clouds but can be driven off effectively by smudge fires. In villages, windows must be kept closed because the midges can pass through window screens. Most species cannot bite, but they are a nuisance because they fly into the eyes, nose, and mouth. The biting midges, moshkara, are identical with the "no-see-ums" of Alaska and northern Canada. At dusk or on overcast days, they swarm about and bite as soon as they light upon exposed skin. The bite feels like the jab of a red-hot needle and produces an itching, red bump. Large numbers of these bites cause a swelling, especially on the face.

Settlements and nomad camps abound with bedbugs, fleas, and lice. Bedbugs are found in bedding and cracks in the dwellings. Fleas and lice thrive as a result of the prevailing unsanitary conditions. When louse powders are not available, the natives rid themselves of lice by turning their clothes inside out and hanging them out doors overnight. In the morning, the clothes are beaten and the frozen insects drop off.

VIII. Climate

The Chukotsk Peninsula has short, cool summers and long, extremely cold winters. Since the transitional seasons of spring and autumn are very short, early traders in the area described the seasons as "July and winter." In summer (mid-June to mid-August) precipitation is light and chiefly in the form of rain. Most of the days are cloudy and very humid. Along the coast, fogs develop frequently. At the beginning of September winter sets in, heralded by a permanent ground cover of snow. Precipitation is light, and fog is less common than in summer. Between snowstorms, the skies are clear and visibility is good. Humidity remains high throughout the winter.

A. Temperature

Summers in the Chukotsk Peninsula are cool, but coastal areas have lower temperatures than the interior because of the moderating effect of the sea. This cooling effect is intensified in early spring when large quantities of drift ice are piled along the shore (Figure 25). Until the ice melts or is blown to sea, the wind passing over the ice produces a refrigerating effect on the littoral.

Summer temperatures generally average in the 40's but freezing temperatures are frequent. Day temperatures sometimes rise to 60°F and occasionally even to the high 70's. At Zaliv Kresta, the warmest

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station on the peninsula, August temperatures average 48°F. Mys Vankarem, on the shore of the Chukotsk Sea, is the coolest station, with an average of 40°F for July.



Figure 25. Drift ice piled along the north shore of the Dezhnev Massif in early spring.

From November through March, above-freezing temperatures are rare. The diurnal variation is slight because little heat is received from the low sun during the short winter days. Since the sea is frozen over, it has no moderating effect on the climate, and coastal temperatures are similar to those inland. Bukhta Provideniya has the warmest January temperatures, averaging 6°F. The coldest temperature ever recorded on the Chukotsk Peninsula was -47°F, which was experienced at both Uelen and Zaliv Kresta.

A common phenomenon during winter is temperature inversion, in which the layer of air at the surface is colder than the overlying layers. The snow cover frequently cools a layer of air 90 to 150 meters (300 to 500 feet) above the ground. Occasionally, this stable

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inversion layer, which is accompanied by haze, may extend upwards for as much as 300 meters (1,000 feet) and severely restrict air and ground visibility.

B. Precipitation

In quantity, the precipitation on the Chukotsk Peninsula is light, ranging from 124 millimeters (5 inches) at Mys Vankarem to 363 millimeters (14 inches) at Bukhta Provideniya. From 60 to 70 percent of the annual total falls in the warmer months -- July to September -- chiefly in the form of rain. Snow also falls frequently during the summer. August is the wettest month, averaging 15 days with rain, and April and May are the driest months.

From October to May, precipitation is in the form of snow, which falls in light but frequent storms. Mys Vankarem averages 92 snowstorms during the year. The snow crystals are generally fine, dry, and needle-shaped and are easily drifted by the strong winter winds. Exposed land is swept clear, while valleys and the lee sides of hills are covered with drifted snow. If the temperature rises, the snow falls as large, wet flakes that are not easily drifted. The permanent snow cover, which forms in September lasts until mid-June. On the average, the ground at Uelen is covered for 242 days a year.

C. Wind

Summer winds are variable, but in general they blow from the northeast. An exception is Mys Serdtse-Kamen', where the majority of the winds are from the west and northwest. Occasional north winds over the Chukotsk Sea blow drift ice landward and pile it in large heaps along the shore (Figure 25). During the navigation season, winds average 3 to 7 meters per second (7 to 16 miles per hour) in the Bering Strait and 6 meters per second (13 miles per hour) in the Chukotsk Sea.

In winter, prevailing winds are from the north. Northeast winds predominate at Bukhta Provideniya and northwest winds at Mys Vankarem and Zaliv Lavrentiya.

Winter is the storm season, with an average of 6 to 7 stormy days a month. On the Chukotsk Peninsula the storms usually last a day, but occasional storms may continue 5 to 7 days. Uelen is one of the stormiest spots, with up to 15 stormy days a month, even during summer. Dezhnev recorded 151 days of blizzards in 1932-33.

The more severe storms are called purgas by the natives. These howling, northwest winds reach velocities of 40 meters per second

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(90 miles per hour) and are accompanied by extremely low temperatures and snow. All outside activity ceases and the people hibernate in their houses or yarangas to wait out the storm. After the storm subsides, clear skies and rising temperatures return.

In the northwestern part of the Chukotsk Peninsula a storm called the yuzhak occurs in both winter and summer. It is accompanied by a south wind that roars down from the mountains at speeds up to 40 meters per second (90 miles per hour). These storms often last 3 to 4 days. In the summer the yuzhak is a menace to small sailing vessels; in the winter, when the yuzhak is stronger, it carries away all unsecured equipment and destroys buildings. During one storm, fuel drums were blown for several miles over the sea ice.

D. Fogs

Fogs of the Chukotsk Peninsula develop chiefly in the Bering Strait and Chukotsk Sea littorals. Fogs also occur along the coast of Anadyrskiy Zaliv but to a much lesser extent. Land fogs are rare and last only 2 to 4 hours. Coastal fogs are the result of warm moist land or sea air moving over the cold offshore water currents that parallel the northern and eastern shores of the peninsula. In winter, when the seas are covered with ice, fogs are least common along the coast.

The duration of fogs varies from a few hours to over 4 days. Although the sun usually burns off a light fog by noon, it reforms late in the afternoon or evening. On the average, fogs last about 24 hours, but in the summer the most severe fogs, which reduce visibility to 4 meters (13 feet), may last for days.

Guba Kolyuchinskaya averages 87 foggy days a year. The greatest frequency occurs during the navigation season (July to September), when 16 to 22 days a month are foggy. In winter, there are only 1 to 6 days of fog a month. January and February are the months with least fog. Mys Serdtse-Kamen' averages 50 foggy days a year, with 13 foggy days a month during the navigation season. Both Uelen and Mys Dezheva have about 95 foggy days a year, with the maximum of 16 days a month occurring during August and September. Bukhta Lavrentiya is the foggiest spot on the peninsula, with 99 days a year.

E. Ice Conditions

The Chukotsk Peninsula is completely surrounded by ice except for a short period in late summer. The ice is of two types; a narrow fringe of landfast ice (ice fastened to the mainland) and a broad expanse of moving pack ice. Hummocky ridges mark the boundary between

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the two types of ice. Landfast ice extends seaward up to 24 kilometers (15 miles) and forms a relatively flat surface. Pack ice consists of a mass of slowly moving, grinding floes 1 to 2 meters (3 to 7 feet) thick. Winds and currents keep the ice pack in constant motion and may push it into piles 9 meters (30 feet) high. In the pack ice, navigation is impossible because of the rapidity with which stretches of water are opened and closed by shifting floes, which may weigh several thousand tons. A ship caught in these movements could easily be crushed.

At the beginning of May the Bering Sea currents begin to melt the ice -- first along the Alaskan shore and later along the Chukotsk shore. By the end of the month the ice cover on the entire Chukotsk Sea and Bering Strait has generally broken up. At this time the seas can be penetrated by powerful icebreakers, but navigation by conventional ships is still impossible. Shifting winds often open up narrow stretches of coastal water, but these openings are either too short-lived or too unpredictable to permit navigation. Because of its sheltered position, Bukhta Provideniya does not become ice-free until mid-July. Bukhta Emma is ice-free from July through September.

In July fragments of landfast ice still remain along the southern shore of the Chukotsk Peninsula, but navigation by unreinforced vessels is possible. By August the Bering Strait is ice-free and navigation along the Northern Sea Route begins. During August and September, some fast ice is still found along the shore of the Chukotsk Sea, but elsewhere only isolated pieces of drift ice remain. Icebergs are almost never encountered in the Chukotsk Sea. When strong west winds blow, floes 6 to 9 meters (20 to 30 feet) thick move from the East Siberian Sea into the Chukotsk Sea. The water becomes jammed with floating ice, and icebreakers are needed to force lanes through the floes. The ice drifts eastward as far as Mys Vankarem before it disperses. Floating ice is sometimes swept into Guba Kolyuchinskaya by winds and strong tides.

By late September young landfast ice begins to form along the shores of the peninsula. In 2 to 4 weeks (by mid-October), ice usually fills the Chukotsk Sea and Bering Strait, and the navigation season ends. Navigation may continue to the end of October in unusually warm years. During the freeze-up, shipping lanes are kept open as long as possible by the icebreakers stationed at Provideniya. From October until the end of July or beginning of August the shore of the peninsula remains ice-blocked. Zaliv Kresta is frozen from September to late July. In Bukhta Provideniya shifting winds and currents may cause the ice to form, break up, and clear several times between October and January; the average number of days with landfast ice is 220.

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F. Light Factors and Visibility

The high-latitude position of the Chukotsk Peninsula produces great extremes in length of daylight and darkness. During the last 3 weeks of December, Mys Vankarem is in complete darkness. After this, the days become progressively longer, and in May continuous twilight replaces the darkness at night. From the end of May to mid-July, daylight is continuous. Then follows another period of nocturnal twilight lasting from mid-July to early August, during which days are over 18 hours long. Thereafter the length of the night increases until December when total darkness again sets in.

In areas south of Mys Vankarem, the extremes of daylight and darkness are less pronounced. Uelen has no period with 24-hour rights, but in January the daylight lasts only 3 hours. In May the darkness of night is replaced by twilight, and during the last half of June there is continuous daylight. Mys Beringa has no period of 24-hour daylight in the summer. In June and July the twilight "nights" last 3 hours, and by August there are 8 hours of true darkness. At Provideniya, January days are 4 hours long, but by May the days have 20 hours of daylight, and the twilight "nights" continue until early August.

The Chukotsk Peninsula is in a region of intense aurora borealis activity. The displays reach their maximum during the long winter nights and may last 2 hours or more. Two types of aurora borealis are visible in the area. The first is shaped like curtains in pulsating, abruptly changing displays, which are sometimes tinged with various colors. The second type is in the form of arcs or ribbons of a greenish hue.

Visibility on the peninsula is best during the winter. Temperature inversions, however, and the accompanying smoke and haze often restrict visibility locally. In winter, thin stratus clouds are found up to altitudes of 3,000 meters (10,000 feet), but they hinder visibility only slightly.

In summer visibility is poor because of frequent rain and fog. The coastal areas are overcast 70 to 85 percent of the time during the period from May to September. Some stations report only 40 clear days a year. In summer, air observation would be greatly reduced by the thick decks of clouds that are found up to altitudes of 7,600 meters (25,000 feet).

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APPENDIX A

GAPS IN INTELLIGENCE

Because of its isolated position the amount of information published about the Chukotsk Peninsula has been limited. During the 1930's and early 1940's a small number of ethnographical, botanical, and geological surveys and general magazine articles describing the area were issued. The significance of the peninsula's strategic military location has increased since World War II and practically no publications concerning its current status have been received. Aerial photography of the interior of the peninsula is almost entirely lacking. Ground photography of both the interior and coastal areas is sparse and old, all prior to 1940. The largest scale maps available covering the entire peninsula are at the scale of 1:1,000,000 and do not provide the detail required.

Detailed information on terrain and land transportation routes is almost completely lacking. Postwar information on settlements and peoples and their economies is very limited.

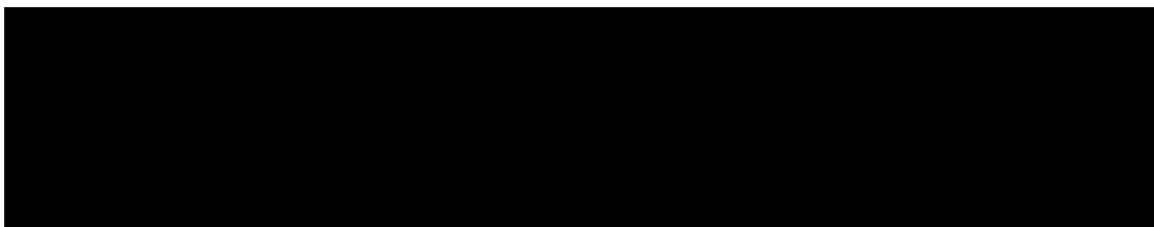
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APPENDIX B

SOURCE REFERENCES

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articles from Russian scientific journals, based largely on reconnaissance from the air and to a lesser extent upon land surveys, were equally important as major sources for terrain and hydrographic data. Among Soviet publications, the Lotsiya Chukotskogo Morya (Chukotsk Sea Pilot), which is available in both Russian and the English translation, provided detailed information of coastal areas along the Chukotsk Sea and the Bering Strait. Information on vegetation and animal life has been gleaned from available Soviet regional studies. Although meteorological observations have been collected for only a few years at most of the stations, the climatic data are considered to be reliable. For the most part, Soviet publications on scientific subjects -- terrain, hydrography, climate, vegetation, and animal life -- are usually reliable.

Many types of intelligence documents were used for this study. A large number were interrogation reports of Siberian and Alaskan natives, as well as former Soviet citizens. A number of reports are based on observations by United States military personnel who visited the region during World War II or shortly thereafter. Although information in many of these reports could not be checked, they are considered to be fairly reliable.

Map coverage of the region is poor. The largest scale maps available are a 1938 Russian map at 1:500,000; the 1948-49 AMS 1:1,000,000 International Map of the World (IMW); and 1:1,000,000 World Aeronautical Charts, revised as of 1953 and 1954. The terrain depicted on these maps, especially the World Aeronautical Charts, is generalized and should be used with caution. Of these maps the AMS 1:1,000,000 IMW series appears to be the most reliable and was used as the base map for the study. Physical and cultural data on this map have been revised on the basis of geographical research and recent Soviet maps. The 1951 Khabarovskiy Kray map at 1:2,000,000 and the 1954 Atlas Mira provided the bases for current place names. United States Hydrographic Office charts were also a source of coastal data.

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Evaluations, following the classification entry and designated "Eval.," have the following significance:

- | | |
|--------------------------|--------------------------------|
| A - Completely reliable | 1 - Confirmed by other sources |
| B - Usually reliable | 2 - Probably true |
| C - Fairly reliable | 3 - Possibly true |
| D - Not usually reliable | 4 - Doubtful |
| E - Not reliable | 5 - Probably false |
| F - Cannot be judged | 6 - Cannot be judged |

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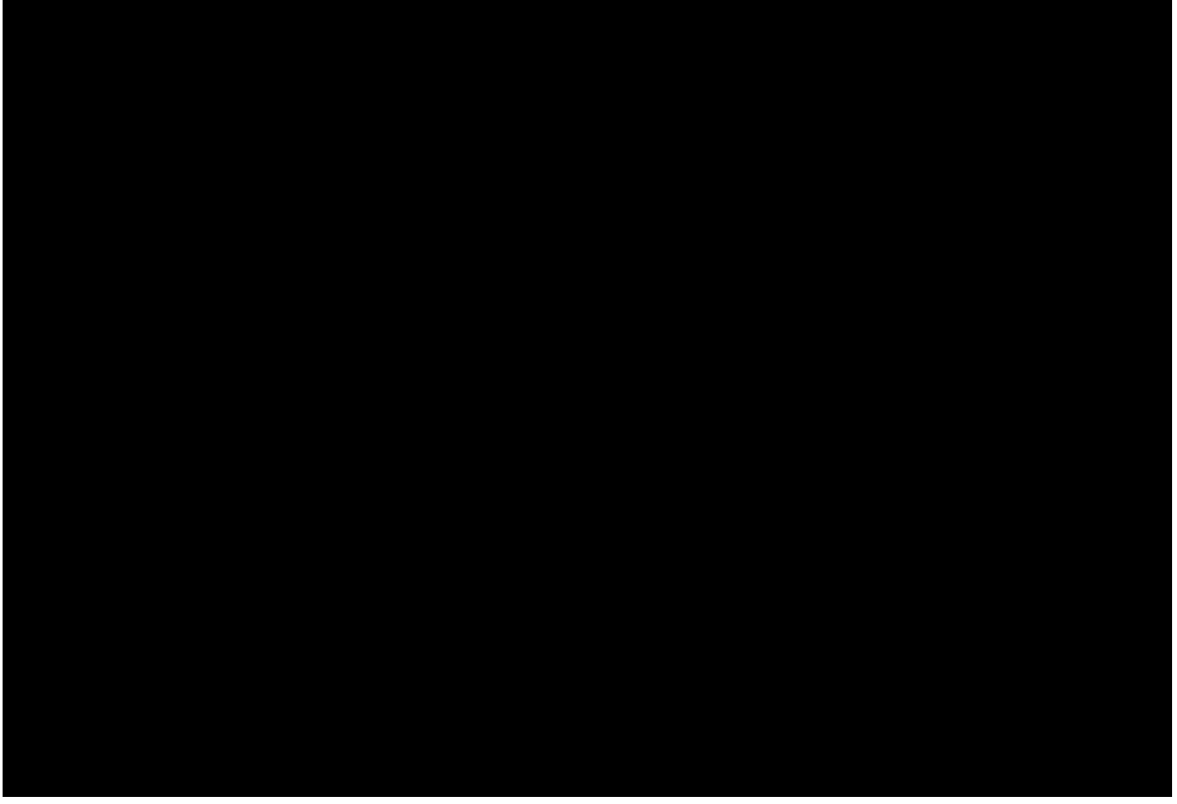
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GEOGRAPHIC INTELLIGENCE REPORT

THE CHUKOTSK PENINSULA



CIA/RR-G-10

May 1955

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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